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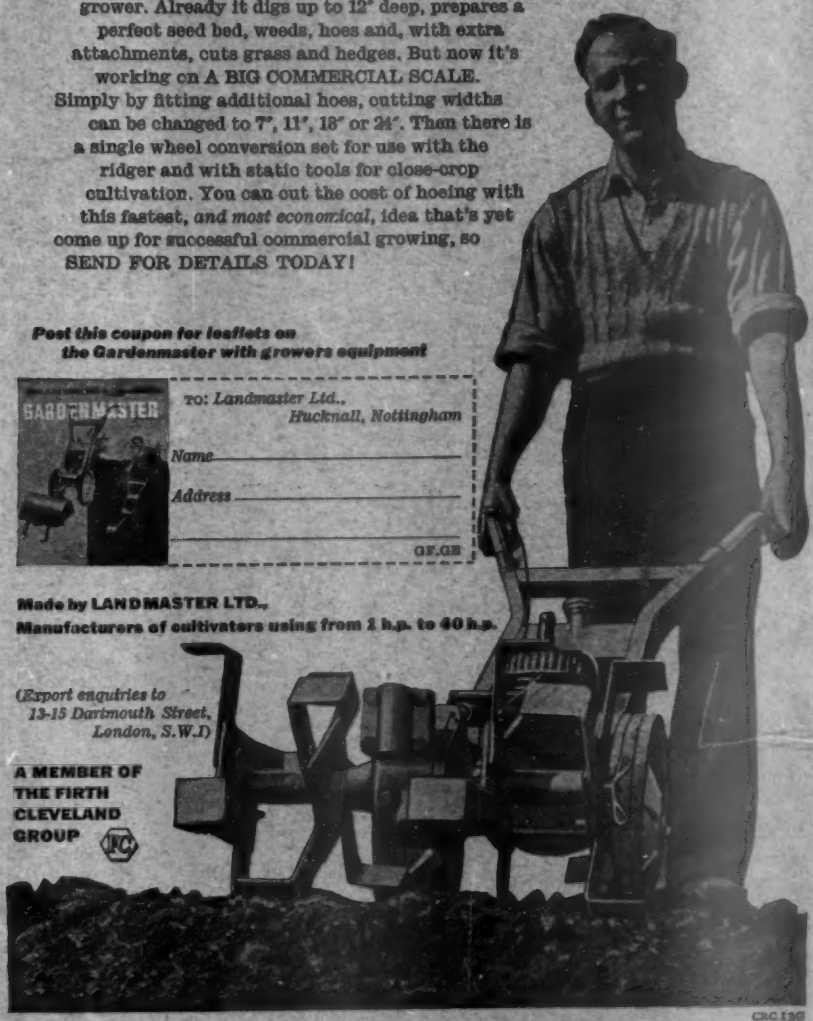

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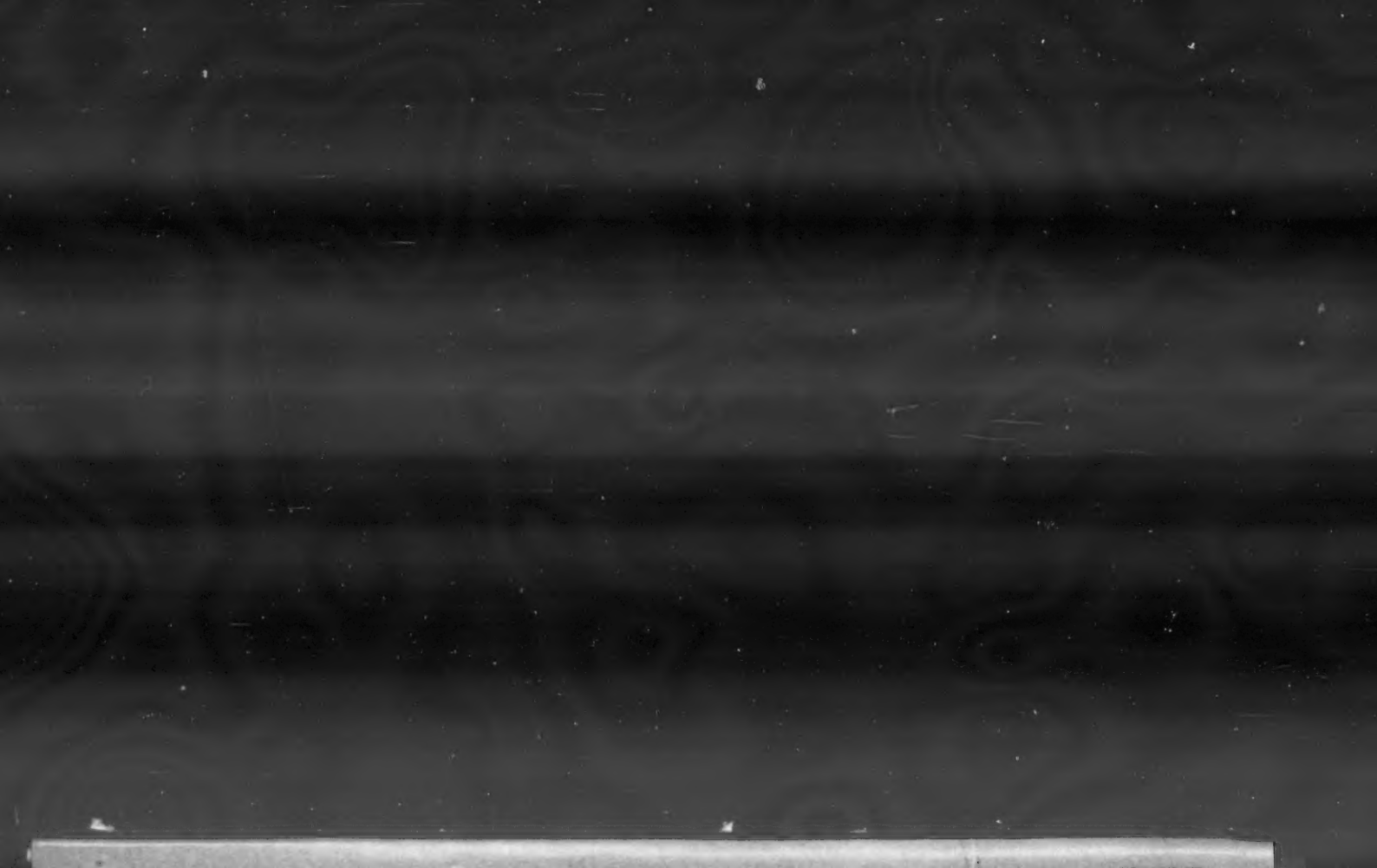


JOURNAL OF THE ROYAL HORTICULTURAL SOCIETY

VOL. LXXXIII PART ONE

January 1958

THE SECRETARY'S PAGE

ANNOUNCEMENTS—JANUARY AND FEBRUARY

Shows

TUESDAY, January 21 12 NOON to 6 P.M. WEDNESDAY, January 22 10 A.M. to 5 P.M.	Fortnightly Flower Show, in the New Hall.
TUESDAY, February 4 12 NOON to 6 P.M. WEDNESDAY, February 5 10 A.M. to 5 P.M.	Fortnightly Flower Show, in the New Hall.
TUESDAY, February 18 12 NOON to 6 P.M. WEDNESDAY, February 19 10 A.M. to 5 P.M.	Fortnightly Flower Show, in the New Hall. Annual General Meeting at 3 P.M. on February 18, in the Old Hall.

Lectures

TUESDAY, January 21, at 3 P.M. "Gardening with Electricity", by MR. A. W. GRAY, A.I.E.E.

TUESDAY, February 4, at 3 P.M. "Some American Botanic Gardens and Public Parks", by PROF. H. W. MILES, M.SC., D.SC.

Annual General Meeting—The Annual General Meeting to receive the Report of the Council for 1957 and a statement of accounts for that year will be held on Tuesday, February 18, 1958, at 3 P.M. The Meeting will be held in the Old Hall, as in 1957, in order that there may be ample room for all who wish to be present, and it is hoped that as many Fellows as possible will attend.

Demonstration at Wisley—On February 26 there will be a demonstration at Wisley on the pruning of roses, commencing at 2 P.M. It will be repeated at the same time on February 27.

Floral Arrangement Competition—A Floral Arrangement Competition, open to all, will be held in the Society's Old Hall on Wednesday, March 5, the second day of a Fortnightly Show. Schedules may be obtained on application to the Secretary.

Wisley Gardens: Reduced Admission by Ticket—At the last Annual General Meeting the President referred to the very large number of visitors to the Wisley Gardens and said that if there were so many visitors that the Gardens became uncomfortably crowded their value to Fellows would be reduced. He explained that it was thought that the petrol rationing which was then in force would probably ease the situation, but in the near future it might be necessary to reduce the number of persons who could obtain admission on presentation of one ticket. Happily, petrol rationing has ceased, but unhappily, as was anticipated, the Gardens have become uncomfortably crowded at certain times, especially at weekends. Consequently, in the interest of Fellows, who provide the Gardens, and for whose use they are primarily intended, the Council has decided that from January 1, 1958, each ticket shall admit only two persons.

Committee Meetings on January 9, 1958—If necessary the Fruit and Vegetable Committee and the Orchid Committee will meet on Thursday, January 9, 1958, to consider novelties. Anyone wishing to submit a novelty to either of these Committees on January 9 must inform the Secretary on or before January 2, 1958, so that the necessary arrangements may be made.

The Society's Examinations in 1958—Candidates wishing to enter for the Society's Examinations in Horticulture to be held in 1958 are reminded that the closing dates for entry forms are as follows: General Examination in Horticulture, and General Examination in Horticulture for Juniors—Monday, January 13, 1958; National Diploma in Horticulture, Intermediate and Final Examinations, and N.D.H. Honours—Saturday, February 1, 1958; Teacher's Diploma in School Gardening, Intermediate and Final Examinations—Saturday, February 1, 1958.

The Ninth International Botanical Congress will be held in Montreal, Canada, from August 19 to 29, 1959, at McGill University and the University of Montreal. The programme will include papers and symposia related to all branches of pure and applied botany. A first circular will be available early in 1958. This and subsequent circulars will be sent only to those who write to the Secretary-General, IXth International Botanical Congress, Science Service Building, Ottawa, Ontario, Canada, asking to be placed on the Congress mailing list.

NOTES FROM WISLEY

THE mention of January is apt to engender thoughts of cold and discomfort, of gardens snowbound or waterlogged. But such thoughts are often quite illusive. January 1957 brought less than the average rainfall, and, although not very sunny, most days were fine and mild and the nights free from severe frost, circumstances which allowed all the winter-flowering plants to give an unusually good account of themselves. If equally favourable conditions obtain during the present month visitors will find plenty to interest them.

The shrubs to which we drew attention last month will still be flowering, and there will now be others worth seeing. None is more popular than the Witch Hazels. *Hamamelis mollis* is the most striking, and usually the earliest (if one discounts *H. virginiana*, an American species with pale yellow flowers before leaf-fall), and its frail-looking petals defy frost and rain in a remarkable manner. The best specimen is in the A.G.M. collection, and on Battleston Hill is a fine plant of the superior Coombe Wood variety which originated in the nursery of Messrs. Veitch, by whom the species was introduced from China in 1876. Of the variable *H. japonica* there is, in the wild garden, a tall specimen about fifty years old of a pale yellow form notable for the clear primrose autumnal colouring of its leaves. *H. japonica* var. *arborea*, of which there is an old plant opposite the end of the peach house, has golden-yellow petals set in a wine-red calyx. In the variety *flavo-purpurascens* some of this deep colour stains the petals, giving a remarkably rich effect when illuminated by the afternoon sun.

Parrotia persica, another member of the Witch Hazel family, grows in many parts of the Gardens. Its foliage, either when in summer green or later crimson and gold, is always handsome and seems always to be free from any kind of insect pest; the trunk, covered with flaking grey bark, has character, and its finely twiggy branches, covered with tiny ruby-red flower-buds, are lovely when viewed against a blue sky. The related evergreen *Sycopsis sinensis*, which comes into flower at the end of the month, really has little to recommend it, for its minute flowers are largely concealed by the foliage, on which they shed a good deal of disfiguring pollen.

Two good evergreen shrubs deserve mention. The first one is *Skimmia japonica*, which can be seen thriving on Battleston Hill and in several other parts. The glossy foliage is always neat and tidy, and supplies an admirable background for the scarlet, holly-like berries in mid-winter. The very necessary male bush has panicles of creamy-white, fragrant flowers in the spring. The second is *Viburnum tinus*, a European species of the highest merit. This, too, is compact, and from an early age annually brings corymbs of cheerful white blossom over a period of three or four winter months. In warm, sunny places these are

often followed by blue-black berries. There are many different forms of it, but even the common one is of greater value than some of the rather mediocre species in cultivation.

The species of *Arbutus* form a group of interesting evergreen trees. *A. unedo*, the common Strawberry-tree, grows and flowers well in the lime-free Wisley soil, its pendent flower-clusters gracefully displayed among attractive foliage; but our climate does not favour fruit-production. It is tolerant of lime, and one very fine specimen known to the writer thrives in an exposed site on the Hog's Back, in almost solid chalk. *A. hybrida*, a natural hybrid between this species and *A. andrachne*, is represented at Wisley by a tree in the north border in Seven Acres, which was planted about forty years ago and now has a pleasing red-barked trunk somewhat like that of the Madrona, *A. menziesii*. The last-named is a small North-West American tree with handsome glaucous foliage. As it does not bloom until April or May it often escapes frost-injury and bears large lax bunches of small, orange-scarlet fruits ripening late in the year.

Much of the beauty of the winter scene is in the trunks and branches of the deciduous trees and in the stems of some shrubs. Some of the more highly-coloured examples, like *Prunus serrula*, *P. maackii* and *Acer griseum*, and the contorted willow and hazel, immediately come to mind; but one hardly realizes the wide variety available until a collection of material is made for a show exhibit like the one staged from Wisley two years ago.

The visitor should not miss a visit to the greenhouses. The very comprehensive collection of varieties of *Camellia japonica* will be found in the trials house, and at the time of writing the bushes are full of flower-buds and promise a wonderful show of bloom. There are also a few items of more than usual interest in the stove house. The large plant of *Agapetes macrantha* (Fig. 1), trained to the glass on the east side, has never carried more flowers. This unusual Ericaceous shrub from the Far East bears clusters of closely packed, pendent flowers from the nodes of its branches and main stem, almost to soil level. The waxy corollas, nearly 2 inches long, hang like little red and white striped lanterns. The Wisley example was a gift many years ago from the late SIR WILLIAM and LADY LAWRENCE, cultivators of many rare and lovely plants.

In the centre section of the house there is a plant of the hybrid rhododendron 'Grierdal' in flower. While it possesses no particular beauty of leaf or flower, this plant which was raised by the late ADMIRAL WALKER-HENEAGE-VIVIAN by crossing *R. griersonianum* with *R. dalhousiae*, is remarkable and probably unique in combining within itself the characters of two distinct groups of the genus, namely the elepidote (or scale-less) group, which never develops scale-like epidermal outgrowths, and the lepidote, in which scales are usually to be found on the stems, leaves and flowers. No other authentic cross between these two groups appears to have been recorded. The characters of 'Grierdal'

are discussed at length by MISS WATERSTON in *Trans. Bot. Soc. Edin.* (1940) and by DR. COWAN in *The Rhododendron Year Book* (1946).

GARDEN WORK IN PROGRESS

The digging and manuring of the trial grounds, annual border and other areas which are replanted annually, is undertaken at the earliest possible date, in order that it may be completed before the onset of really severe weather. In a garden as large as Wisley the clearing up of fallen leaves is a considerable undertaking, and it is important that the winter rosettes of such woodland plants as meconopsis and primulas be kept free from an accumulation of debris. All leaves are collected and stacked for future use in summer mulching or otherwise. Another important winter operation is the pruning of the larger trees and the removal of dead boughs.

An interesting piece of work which has been going on in recent weeks is the clearing of a strip of woodland between the cherry field and the public footpath traversing Battleston Hill. Twenty years ago, when the hill was acquired by the Society, it was covered with bracken, gorse and bramble, and its development was greatly delayed by the war. The piece now receiving attention, about an acre and a half, is all that remains to be permanently planted. It will provide accommodation for a number of Wisley-raised hybrids of *Rhododendron discolor*, now about 6 or 8 feet tall, which had become overcrowded on the south-east slopes of the hill. About sixty varieties of *Camellia japonica* will also find a home here.

Extensive replanting has also taken place recently in Howard's Field. Years ago, many shrubs and trees of botanical rather than horticultural interest were planted here and the place has become somewhat overgrown. There are, however, some very good trees of various species of maple, cherry and other genera which will be seen to better advantage in future.

A large number of bushes of *Rhododendron luteum*, removed from the hedges flanking the broad walk to Battleston Hill, have been planted along the left-hand side of the road leading to the Gardens. Their yellow flowers in May, and agreeable autumnal tints, should make the approach more colourful.

MASTERS MEMORIAL LECTURE, 1957

THE WATERING OF FIELD AND GLASSHOUSE CROPS IN THE UNITED KINGDOM

E. J. Winter, M.C., M.Sc.
(National Vegetable Research Station)

(*Lecture given on November* 5, 1957; MR. T. NEAME, V.M.H., *in the Chair*)

PART II

THE CHAIRMAN: We are today looking forward to hearing from MR. WINTER the second instalment of the Masters Memorial Lecture for this year on the watering of field and other crops.

I am looking forward to it myself because some years ago I installed an irrigation plant for fruit. I am convinced that there are times, and many times in our climate, when our plants are not making the growth they should owing to lack of the water that they need.

There are various views on this. In his previous lecture MR. WINTER quoted the views of an American scientist who thinks that a plant can go nearly as far as wilting point without suffering. I cannot think that is right. We do not let our babies go hungry. On the contrary, we feed them regularly, and I think we have to feed our plants regularly.

MR. WINTER: General principles relating to the application of water to the soil, and its use by plants were described in the previous lecture. The use of these principles in practice is discussed below.

When to water a plant depends upon the kind of plant, its stage of growth and the moisture content of the soil. For example, SALTER showed that the growth rate and yield of glasshouse tomatoes was reduced when the soil moisture fell below field capacity (1). With cauliflowers he found that growth rate and final yield were adversely affected only when 50 per cent of the available water had been used (2). STANHILL, working with carrots and turnips (3) (4), demonstrated that the same soil moisture stress applied at different stages of growth had different effects on final yield. Heavy watering has been found to increase the proportion of foliage of most plants, e.g. turnips, carrots, cauliflowers, radish (5), tomato (1), but the intensity of the effect was not uniform at all stages of growth of the plants. Furthermore, the effects of soil moisture stress during growth upon subsequent quality of the produce may differ in different plants. STANHILL showed that the tasting quality of turnips was improved by heavy watering especially during the last three weeks of growth; even a single wet period in very early life improved the taste of the turnips produced later. On the other hand, carrots grown under wet conditions had poorer flavour than those

grown under drier conditions. Incidentally, this difference was detected not only by a trained tasting panel but also by untrained members of the general public.

Thus, when considering when to apply water, each stage of each crop must be considered separately. The best watering treatment has been determined for comparatively few crops; with few exceptions, the yield of produce from plots given a wet treatment has usually been found to exceed that from plots given drier treatments. The reasons for the exceptions were often unconnected with the effect of water on plant growth, but were caused by secondary effects such as leaching of nutrients, encouragement of disease and drowning of young seedlings. Heavy watering increased marketable yield not only when the desired produce was foliage but also when it consisted of storage organs such as turnip roots or cauliflower curds.

For every stage of every crop, there is apparently a soil moisture status below which the soil must not be allowed to fall if maximum yield is eventually to be obtained. On a mixed holding it would obviously be uneconomical to provide optimum soil moisture conditions at every stage of every crop; the best practicable irrigation treatment will be one which ensures that the soil moisture content does not fall below a specified minimum only at moisture sensitive growth stages of each crop. The sensitive stages must be determined by experiment.

Account must also be taken of the idiosyncrasies of the market for which the produce is intended. For instance, in some markets small cauliflowers fetch a higher price than large ones, whereas in others, the large curds are preferred. Small curds can be grown by allowing more than 50 per cent of the available water to be depleted from the soil before each irrigation or by planting more closely than usual and giving extra water to avoid possible competition for moisture. Cauliflowers grown under comparatively dry conditions mature earlier than those irrigated frequently and for that reason alone are likely to command a higher price. Thus the watering treatment of this crop must be considered in relation to earliness, market preference, and yield of saleable heads per acre (Fig. 2).

Efficient irrigation should ensure that water shortage does not seriously limit crop growth. When this object has been achieved, however, other factors may become limiting, e.g. nutrients, and it may be desirable to apply nutrients in the irrigation water. Liquid feeding has been developed to a highly successful degree with trickle irrigation, especially of tomatoes, and feeding this crop by top dressing is now obsolescent. Some plants can absorb nutrients directly through their leaves (6), but it is doubtful whether this has any advantage other than the rapid reduction of nutrient deficiency symptoms, because in practice a large proportion of the applied nutrients would be washed into the soil and taken up by the roots in the ordinary way. Eminent growers have claimed that the application of nutrients in the irrigation water gives higher yields than top dressing with dry fertilizer. Insecticides

and fungicides also could be applied in the irrigation water, but except for systemics, such a procedure presupposes that the occurrence of the attack to be combatted coincides with the need for irrigation, so that a combination of the two processes will be only rarely feasible.

It has been suggested that whenever a crop is irrigated, sufficient water should be applied to restore the soil in the whole rooting zone to field capacity, so that the next irrigation can be delayed for the longest possible period. After irrigation, water evaporates from the wet soil surface at the same rate as from an open water surface until the first ¾ inch has been lost; the longer the interval between watering, the fewer the occasions on which water will evaporate from the soil at the maximum rate. Thus, restoring the soil to field capacity at each irrigation can result in the saving of both water and labour.

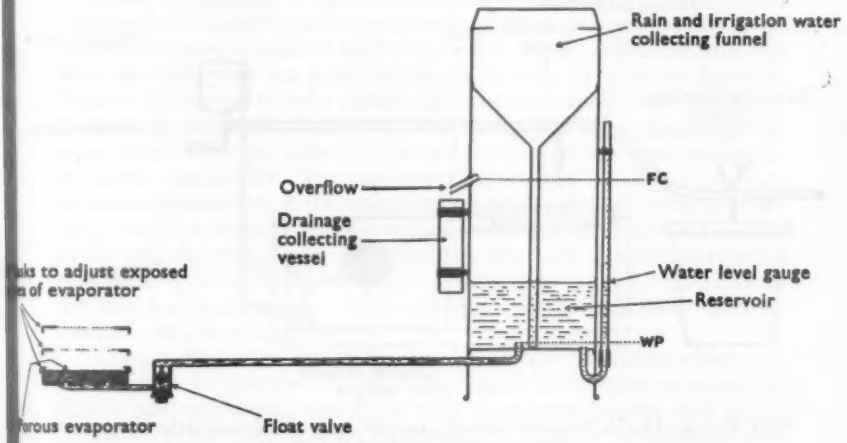
On the other hand both OWEN (7) and STANHILL (unpub.) have found that a small application of water to plants already subjected to moisture stress causes them to grow faster than plants in soil kept continuously at field capacity. With celery, STANHILL obtained higher yields by planting in comparatively dry soil and giving very small waterings thereafter, than by planting at field capacity and not watering subsequently. Bearing in mind the general shortage of water supplies in this country, the most practicable irrigation treatment may therefore prove to be occasional small applications of water, at specially sensitive growth stages in contrast to attempts to maintain definite soil moisture regimes during different phases of the life of the plants.

Different workers have used different criteria for expressing the soil moisture conditions under which their plants were grown. For example, ROGERS (8) and HUDSON *et al.* (9) have used the soil moisture tension; BOUYOUCOS (10) and FARBROTHER (11) have used electrical resistance of the soil; PENMAN (12) has calculated the moisture deficit from meteorological observations; the N.V.R.S. workers (*loc. cit.*) have expressed their results in terms of depletion of available soil water. Methods employing any of these criteria could presumably be adapted for commercial use if experiments were done to enable the grower to decide at what tension, or electrical resistance, or PENMAN deficit, or depletion of available water each of the crops growing on his particular soil needed to be watered.

It would obviously be better if all workers used the same units of measurement, but there is considerable uncertainty as to which method will eventually prove most satisfactory for growers to adopt. A method for commercial use should involve neither expensive apparatus, nor time-consuming observations; it should give data in readily understandable terms, and preferably should indicate directly the quantity of water to be applied, and the growth stage of different crops, at which to apply it. No instrument so far fulfils all these requirements.

At Wellesbourne, the use of tensiometers and resistance blocks has been abandoned in favour of direct measurement of the soil moisture status coupled with modifications of the PENMAN approach, and an

instrument (13) has been developed which, in effect, measures the parameter which is calculated in the PENMAN method (Text Fig. 1). The instrument is intended to be placed in the crop, where its special gauge collects and stores rain and irrigation water. This storage tank feeds an evaporator which loses water under the influence of the same climatic factors which affect the evapo-transpiration of the crop/soil system. Thus, the level of water remaining in the tank at any time corresponds to the amount of water left in the soil. An overflow is provided so that whenever the soil reaches field capacity, the loss from the overflow shows the amount of drainage through the soil. When the amount of water remaining in the storage tank indicates that the soil is at wilting point, the feed to the evaporator is automatically interrupted, just as



TEXT FIG. 1—Instrument to indicate the current soil deficit

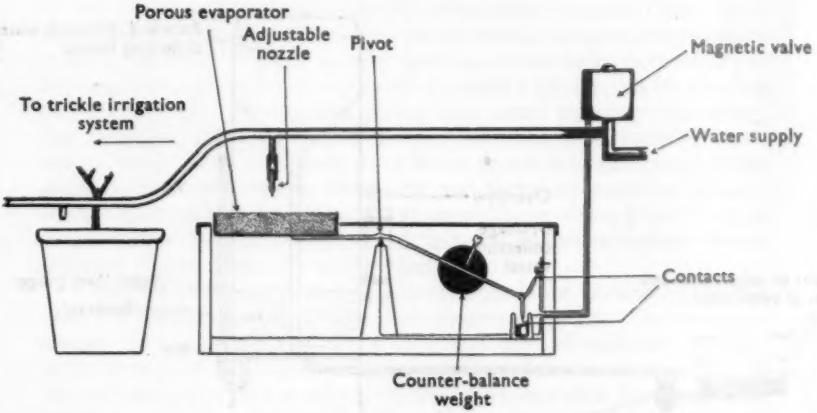
evapotranspiration ceases at permanent wilting point. Readings from six of these instruments tested this summer at Wellesbourne agreed with the measured current soil moisture deficit under grass, to within half inch of rainfall. DR. HUDSON kindly installed two of the evaporation units in a glasshouse tomato crop at Sutton Bonington and the readings agreed with his lysimeter measurements within similar limits.

This instrument does no more than indicate continuously the amount of water needed to restore the soil to field capacity, i.e. the current deficit, and any drainage which may have taken place. It does not indicate when the crop should be irrigated, but it would enable the grower to apply experimental results which are expressed in terms of PENMAN deficit, or, knowing his soil moisture characteristics, the results of experiments expressed in terms of loss of available water.

A somewhat similar device has been developed by SALTER for the

automatic watering of glasshouse plants (Text Fig. 2). Loss of weight of an evaporator unit makes an electrical contact which starts up the irrigation system. One nozzle of the irrigation system is set over the evaporator to re-wet it; on regaining its original weight, the disc breaks the electrical circuit and switches off the irrigation system. Application of water is thus automatically controlled by the same evaporating conditions as affect the plants. Such a system should appeal to the amateur, who would be able to leave his plants unattended for several days at a time knowing that their most urgent need was effectively provided for.

Few critical comparisons of conventional glasshouse watering equipment have been made. SALTER obtained increased tomato crop from



TEXT FIG. 2—Device for automatically controlling a glasshouse irrigation system according to the needs of the plants

trickle irrigation as compared with hose watering (14). Experiments by FISHER (15) at Sutton Bonington showed that traditional methods of deciding when to water pot-plants (such as "when the pot rings on being tapped", or "when the surface soil becomes dry") gave reasonably good results in terms of reproducible soil moisture conditions, provided that care was taken to standardize the procedure adopted. There appears to be little need for expensive instrumentation to help a trained plantsman to know when a pot requires watering!

It is usually accepted that when a pot is watered, the space above the soil should be filled, and so there is through drainage at each watering. The loss of nutrients occasioned by this leaching can be avoided, however, by the system of automatic watering described above.

Most of the world's field irrigation is done in furrows, and the almost total absence of the system in this country is due to the high cost of labour and the considerable waste of water when this method is used

with shallow-rooted crops. The application of water by means of rain guns is cheap, quick and effective, but the damaging effect of the heavy output from these machines precludes their use in horticulture, though they are satisfactory for rapid watering of pasture and sturdy crops which completely cover the ground. For horticultural crops where a large proportion of the soil area is not protected by foliage, rotary sprinkler lines are cheaper, simpler and easier to move than oscillated spray-lines, but their water distribution is often less uniform. It is probably better to use spray-lines for crops which are to be harvested at one time, e.g. radish, celery, canning peas, whereas crops over which several cuts are taken (e.g. cauliflower and lettuces) can tolerate the use of the cheaper and more easily-handled sprinkler equipment.

In commercial practice the quantity of water applied is rarely measured accurately. A notable exception is the trickle system where one nozzle is set over a can to measure the volume of water applied. The amount of water applied in field irrigation is usually estimated from the time the equipment has been running; this crude method can be satisfactory, but errors may be introduced by variations in water pressure, spray drift, and similar factors. A good method of measuring irrigation water is to set out an array of cans and to measure the water collected, by means of a dipstick. The instrument depicted in Text Fig. 1 provides an automatic measure of the amount of irrigation. If tensiometers, resistance blocks or similar instruments have been installed at different depths in the soil, the abrupt change in readings when the water front reaches each sensing element can be used to decide when the required depth of the soil has been wetted. This method is more frequently used in research than in commerce.

The problem of achieving those soil moisture conditions which will enable crops to give the best economic return is complex especially as this is not necessarily associated with maximum growth and yield. Irrigation procedure must be considered in relation to nutrition and planting distance and the combined effect of these factors on earliness and quality of the produce. Aside from these ideals, however, the problem which is most likely to affect the ordinary grower whose resources of labour, water and equipment are limited, occurs in time of drought, when he must decide which of his crops can be left unwatered and which must be irrigated if he is not to suffer loss of yield or quality. Information on this aspect is being accumulated. On the other hand, detailed recommendations based on the fundamental interactions of different irrigation treatments with nutrient levels and planting distance cannot be expected for many years.

ACKNOWLEDGEMENT

I wish to acknowledge with thanks the efforts of my colleagues DR. SALTER and DR. STANHILL who have carried out many of the experiments referred to in these lectures.

THE CHAIRMAN: I am sure you have all listened with intense interest, as I have, to this very interesting address by MR. WINTER. It has given me some shocks.

For instance, there is the question of flavour versus size. At the previous lecture MR. SECRETT was in the chair. He is a vegetable grower, and you have heard something about his work from MR. WINTER. I am a fruit grower. After our 1949 drought I felt so strongly that irrigation was important, necessary and essential that I took a trip round the world to study what was being done in other parts of the globe—Australia, Africa, America, and so on. In America I learned—I am thinking in terms of apples; I am principally interested in apples and pears—that if you let your apple trees have a dry time, the apple will stop growing, and when you give it moisture again, it will carry on. It does not seem to be quite the same thing with vegetables.

With regard to flavour and size, I strongly believe that we have to give the public something that has some flavour. We think the flavour is important, but size is most important, too with our apples. It is always a problem to me why little apples are so hard to sell, because I think they are preferable. On the other hand, as a grower I have to get a living. I want to make the apples a little larger, and so I irrigate.

My experience is that we have not yet proved how much good irrigation does, but at East Malling, where MR. GOODE is working on the problem under DR. ROGERS, there are indications that even if it does not help this year, you get more tree and you get your return in subsequent years. However, we are dealing with perennial trees and MR. WINTER is dealing more with vegetables.

The question of the period of application interests me. I have formed the view that our trees should never suffer from lack of water, but there are indications from the work at Wellesbourne that there may be periods which are more critical and more important than others. We have some of DR. ROGERS' tensiometers, but we regard them only as an indication of what is going on down below, and work very largely on the figures worked out by DR. PENMAN which are published in the press. We set his calculations against our rainfall and irrigate accordingly.

Furrow irrigation has been very widely used, and is still widely used all over the world, even in the U.S.A., though it is going out and they are tending to turn over to sprinkler irrigation, for by that means you get better distribution and less compaction of the soil. In our case at home, we could not use furrows because our fruit is grown over grass, a practice which is being very widely adopted in this country.

I do not like the rain-gun method although it is an easy way of getting the water on, and is probably much more economical than the sprinkler irrigation method, which entails considerable outlay on distribution mains.

We believe that more and more irrigation is essential, and we are very grateful to the people at Wellesbourne who are going into the

problems so that they can advise the commercial grower on how he should treat his crops.

MR. SMITH: I am a tomato grower and I evolved my method of watering ten years ago by a process of trial and error. I do not water when planting out, other than just damping in. As soon as the first truss is set I give one pint per plant at intervals according to the weather. When a tomato plant has sufficient water, it has a rich yellow bloom, but it is paler when it needs moisture. When the second truss is set I increase the amount of water per plant. I find that a little water at the right time, at short intervals, gives me a better crop than a full watering at long intervals. I suggest that the reason is that in the drying out process between heavy waterings, some of the root system is damaged. (*Remarks abbreviated.*)

MR. WINTER: At Wellesbourne we do not deal specifically with the tomato because it is not considered to be a vegetable, but of course we are interested in the water requirements of all plants. DR. SALTER worked on the glasshouse tomato at Sutton Bonington and his results agree generally with MR. SMITH'S experience.

DR. SALTER showed that ball watering was unnecessary if the plants were set out in soil near to field capacity. I assume that MR. SMITH'S soil is flooded during the winter-time.

MR. SMITH: I flood it at the time I apply the formaldehyde. I put five gallons of formaldehyde in, and double dig the soil.

MR. WINTER: We can assume therefore that your soil is near to field capacity when the plants go in. In fact your general irrigation procedure approximates to that which SALTER has recommended. You are replacing previously evaporated water at short intervals. It happens that under your conditions daily evaporation is about one pint per plant while they are small, increasing as they grow, and as the weather gets warmer and the evapotranspiration rate increases.

MR. MORRIS of N.I.A.E., Wrest Park, is present. He has measured evaporation inside glasshouses, and perhaps he would care to comment.

MR. MORRIS: At Wrest Park we have been measuring the rate of loss of water from tomato plants by growing the plants on a weighing machine. The main result that we obtained is that the water loss is dependent on the amount of energy received from the sun during the same period. The amount of water lost is equal to about 65 per cent of the amount that the solar energy could evaporate.

We also grow tomato plants in our 150 feet × 30 feet glasshouse and we follow the principle of putting on a little water frequently. We find that we get good results. However, we have not done any comparative experiments with watering regimes, to compare frequent watering and less frequent watering.

MR. WINTER: I should like to add something to my previous remarks. SALTER compared the yield of tomatoes grown under various dry regimes (large quantities of water at long intervals) with that produced under wet regimes (small quantities at short intervals). In one treat-

ment he maintained the soil moisture content above field capacity, and this treatment gave the highest yield. As might be expected, however, the flavour of tomatoes grown under these conditions was poorer than that obtained under drier regimes.

MR. SMITH: I can only quote my experience, and it tells me that in the early part of the cropping year you may get a bigger yield on the bottom four trusses. I do not wish to deny that. But my point is that later on in the year, towards the end of July, I have found that heavy waterings cause the plant to give up the ghost. If you have adopted the heavy watering system and you get a very hot August, the plant just passes out because the root system has gone. If you adopt the little and often watering system, it is possible that the bottom four trusses may give you a slightly smaller yield, but that is more than made up for because the life of the plant is considerably extended and on the whole it will stand a hot sun during August very much better than the other plant.

MR. COHEN: I remember that some years ago MR. SECRETT said that in growing vegetables, particularly brassicae and lettuce, he used in his overhead watering system one part in 10,000 of potassium nitrate (saltpetre), and that he had effective watering and the administration of a good nutrient, and he also kept all the aphids at bay. That seems to me to be a three-in-one system which might be practised a great deal more generally. Has MR. WINTER had any experience of it?

Also, when the dry plant receives water and increases in growth in comparison with its wet neighbour, is that due to the fact that the soil is warmer as well as to the plant roots being more fibrous?

MR. WINTER: MR. SECRETT was one of the pioneers of putting nutrients into the irrigation water and this is now his normal practice. We have postponed detailed investigation of this method of nutrition because we think that it is less important than determining when and how much to irrigate.

I have no information as to the killing of aphids with potassium nitrate. It seems to me that it might be better to use a systemic insecticide in the water.

With regard to the effect of irrigation on soil temperature, our few experiments on this subject showed no material reduction in soil temperature following the application of normal quantities of cold water, because the amount of heat taken from the soil to warm the irrigation water was small compared with the total amount present. On the other hand, I think we would all agree that the temperature of the water applied to glasshouse pot plants should be the same as that of the glasshouse itself; otherwise they will receive a thermal shock because of the comparatively small volume of soil available to act as a buffer for the plants.

THE CHAIRMAN: Our time has expired. We are very grateful to MR. WINTER for giving up an afternoon to talk to us about this most fascinating side of the growing of plants. I ask you to accord your appreciation in the usual manner.

The vote of thanks to MR. WINTER *was accorded with acclamation.*

MR. WINTER: Thank you very much. I can assure you that it is not a question of giving up an afternoon. It is a great pleasure for me to come here.

The proceedings then terminated.

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THE SUNNINGDALE NURSERIES

J. P. C. Russell

IF you drive about a mile out of Sunningdale towards Bagshot in early May, there is a very fine row of pink horse-chestnuts on the right-hand side of the road. These chestnuts were planted by the late HARRY WHITE about fifty years ago and the entrance to the Sunningdale Nurseries is at the end of this line. However, before driving in we should perhaps consider the nursery in the past.

Before 1847, Messrs. Standish and Noble are said to have grown their plants on the site of the old Royal Kennels, opposite to the gates of Bagshot Park, below the bridge on the Bagshot–Bracknell road, and there are still a number of rhododendrons of rather dubious parentage to be found there.

In 1847, they moved towards Sunningdale, which at this period was virtually non-existent. The present nursery site was only a corner of the

main nursery and apart from the Italian ground was used chiefly for growing oats for the horses. The main nursery extended from the Devenish Road to the Lady Margaret Road and over part of the site of the Ladies' Golf Links. Originally, the present office buildings consisted of two foresters' cottages in Windsor Forest. These were linked by hay-barns and sheds to become the stables to Thankerton House where NOBLE himself lived.

Standish and Noble had a catholic taste in plants and grew a very large selection of camellias, roses, rhododendrons, trees, shrubs, fruit trees and even calceolarias and other greenhouse plants. The main connection of the nursery has always been with the rhododendron, and Standish and Noble were pioneers in the hybridizing of the American, Caucasian and Himalayan species which were in cultivation at this date. Although some of these early crosses survive at the nursery, none of them is worth propagating at the present moment and the most interesting event in these early years is the arrival of the seeds of the Himalayan rhododendron species in 1849, from SIR JOSEPH HOOKER. Some twenty-six kinds were raised, and hybridization was commenced as soon as flowering began. A rather ingenious system was used here. Large standard rhododendrons were grown in the greenhouses and scions of the new species were grafted onto the branches of these, producing flowers long before a normal plant could do so. By using these methods *R. thomsonii* was flowered for the first time in Europe in 1857, and from this flowering R. 'Ascot Brilliant' was produced in 1865 and this is still a variety very well worth cultivating. This plant was distributed by STANDISH, who parted from NOBLE in 1857 and established a nursery in Ascot. Presumably, some of the pollen of *R. thomsonii* left with him.

With STANDISH's departure, it became obvious that he was the real plantsman of the two partners. The catalogues remain extremely representative, but no longer contain so many fascinating new plants. Before the separation, both DOUGLAS and FORTUNE had collected for the nursery and the catalogues list a stream of rare trees and shrubs, Moutan paeonies and unusual camellias. Amongst the introductions at this time were *Rhododendron* (*Azalea*) *indicum* var. *crispiflorum* (*macranthum*) and *Rhododendron* (*Azalea*) *amoenum*. We are fortunate enough to possess a complete set of catalogues from 1847 to 1898, when NOBLE gave up the nursery, and also NOBLE's notebooks for the earlier years. It is a very curious fact that the deciduous azaleas, of which he grew some five hundred sorts, are merely mentioned by name and are hardly described at all in the lists.

The late HARRY WHITE used to live on the farm which stood on the site of the present Sunning House on the golf-links. About 1867 he came to the nursery as a boy and his great enthusiasm and knowledge of plants soon brought him to the notice of both CHARLES NOBLE and SIR JOSEPH HOOKER, and NOBLE eventually made him his manager. At NOBLE's death, the nursery was purchased by the KEMP-WELCH family and then by the late SIR HUBERT LONGMAN, and HARRY WHITE remained

in charge until his death in 1936. One of his first actions was to lay down a large stool ground of azalea hybrids. Most of the Ghent hybrids are of considerable age. A large collection of these were put down about 1898 and also all the newer *molle-japonicum* and *occidentale* hybrids as these were introduced from Messrs. Veitch or, later, bought from the KOSTERS. These stools are still flourishing nearly sixty years later. Soon the main flow of Asiatic rhododendrons began and through the kindness of the late MR. J. C. WILLIAMS, the late MR. LIONEL DE ROTHSCHILD, the late LORD ABERCONWAY and the late MR. J. B. STEVENSON in particular, HARRY WHITE received nearly all the sendings of WILSON, FORREST, ROCK and KINGDON-WARD and built up an astonishing collection of wild rhododendrons. He also did a great deal of hybridizing and raised many hybrids between *R. souliei*, *R. campylocarpum* and *R. thomsonii*, which he never bothered to name. The late COLONEL F. R. S. BALFOUR also sent many notable plants to the nursery for distribution; outstanding amongst these were *Picea breweriana* and, in 1923, the charming *Rhododendron* (*Azalea*) *atlanticum*. About 1907, the late MR. LOUIS GRAY came down from London to help HARRY WHITE in the office. He soon became a rhododendron enthusiast and on HARRY WHITE's death in 1936, he took over the nursery.

In 1939, the nursery was bought by MR. HAMILTON-SMITH and MAJOR HERBERT RUSSELL, M.C. At this period it formed a curious anomaly for the outer suburbs. Very little had been spent on it since NOBLE's day. The house had no drainage, no light, and water only by courtesy of a house on the main road. There were no frames and no greenhouse and all propagation was carried out by layering, or else by taking cuttings under bell-jars. This position was impossible to remedy until nearly the end of the war and during this period the late MR. GRAY and two men held the fort and it was largely due to MR. GRAY that all HARRY WHITE's selected colour forms of the rhododendron species were preserved.

At the end of the war the nursery was a jungle which might have given any plant-hunter pause. There were solid blocks of conifers about 12 feet high and many of the more repellent species, such as the *palmata* bamboos and *Spiraea douglasii*, had covered enormous areas. A sharp machete was needed to get through the shrub drifts and everywhere couch-grass was deeply established. During the next ten years, the whole area was gradually cleared up, adequate propagating houses and greenhouses were built up and the main lines of the present nursery laid out.

The collection of rhododendrons was already a remarkable one, but deficient in hybrids and a very large number of these were added to the collection, chiefly those raised by the late MR. LIONEL DE ROTHSCHILD. At the same time, a large number of his Knaphill strain azalea hybrids were planted in the old stool beds, which by now needed some drastic treatment. During the period of the war, these had grown up to a considerable height and with some misgivings, they were sawn off at ground

level, leaving stumps as large as a fair-sized tree. With very few exceptions, they recovered perfectly and are producing as well as ever.

The collection of evergreen azaleas was added to tremendously from the collections of the late MR. J. B. STEVENSON and MR. HAMILTON-SMITH and many new hybrids were purchased from various sources. The whole collection of shrubs and trees was reviewed and a great deal added and many out-of-date varieties removed.

New collections were built up of tree and herbaceous paeonies, camellias of all sorts, shrub roses, ferns and grasses and many foliage plants. When MR. GRAHAM THOMAS joined us in 1956, the roses, naturally, achieved a tremendous advance and his wide knowledge of every sort of plant has already proved of great benefit.

At the present day the nursery contains roughly sixty acres of partly wooded, partly open ground. There is an astonishing range of soil, all of it, apart from a small area of old Windsor bog, extremely well-drained and ranging from sand and gravel through peat to light loam and the heaviest of blue clay. The climate is treacherous in the extreme. The nursery is very low-lying and especially susceptible to spring frost and because the sub-soil is sand to a great depth, the temperature can change with great rapidity.

The varied types of soil enable us to grow a tremendous range of plants and while we grow a very comprehensive list of shrubs and trees, it might be said that I specialize in every sort of rhododendron and azalea, especially the species and woodland hybrids, camellias and all sorts of ericaceous plants, and MR. THOMAS in shrub roses, rose species, musk and rugosa hybrids, and in all the new perpetual-flowering shrub roses and climbers.

We have a joint enthusiasm for every sort of unusual herbaceous and foliage plant, grass and fern with two main aims in view; to provide fine, weed-excluding ground cover for shrubs and rhododendrons; and to provide a bottomless cornucopia from which the flower decorator can draw an endless supply of new and unusual shapes and colourings. As we grow a lot of uncommon plants and many which need some years to mature, we have laid out the nursery so that a large number of these can be seen as specimens.

THE NURSERY

The entrance drive runs straight for some two hundred yards and then curves in a dog-leg towards the offices (Fig. 7). This first section is lightly shaded by tall Scots firs and Turkey oaks and is flanked by drifts of the newer hybrid rhododendrons and azaleas, including many of the best varieties raised by the late MR. LIONEL DE ROTHSCHILD. There are also drifts of camellias here. These beds are part of a large rectangular field which was taken in hand some five years ago. The soil is of a much heavier clay than the rest of the nursery and immediately beside the main road are the pits from which the clay was dug for the military camp on Fireball Hill, in George II's day. Fireball Hill is a low mound

behind the nursery and separated from it by the Devil's Dyke, the Roman road to Silchester.

This particular part was so unworkable that it has been turned into an ornamental glade with large drifts of ericas, cistus and genistas, many sorts of rhododendrons, azaleas, hydrangeas and shrub roses; of the latter 'Vanity' is very remarkable late in the season with her immense heads of rose-pink flowers.

From this glade runs a wide grass walk, flanked by ornamental borders, which sweep right across the nursery to a fine baroque statue of PALLAS ATHENE (Fig. 5). In the first field the walk is flanked by cherries and the blue-grey spires of *Cupressus arizonica* and is used to display all sorts of roses and foliage plants, including a large quantity of floribunda and hybrid tea roses, which are being tried out as shrubs (it should be explained, perhaps, that we are only interested in roses as shrubs and not as exhibition flowers). On the left-hand side is MR. THOMAS'S rose trial ground. This is really a living copy of his manual of shrub roses, spread out on the ground and is an astonishing sight in June and July.

To the right of the walk are shrub and tree stool beds and many drifts of young roses and shrubs of all sorts. A broad grass walk with an avenue of different kinds of malus leads back to the drive. At the top of this field there are beds full of choice paeonies, including many tree varieties, and a number of choice shrubs. These are backed by beech hedges with specimen plants of *Photinia beauvardiana*, which connect with the next section of the grass walk. To the right of these beds is a group of trees, which shelter the greenhouses and propagating yard, with their accompanying drifts of young cuttings, seedlings and grafts. A camellia walk winds round the outside of these trees, almost as far as the drive. The camellias here are young, but represent almost all the varieties in the collections of the SŒURS GUICHARD of Nantes, COLONEL J. N. HORLICK, O.B.E., the late MR. LIONEL DE ROTHSCHILD, the late DR. AMSLER and a number sent from Australia, through the kindness of MR. HAZLEWOOD and from Japan, by MR. ROKUJO.

The second half of the long walk is steered carefully between a fine pair of *Pinus bungeana*, the Chinese white pine. These are some fifty years old and just beginning to show the fascinating jade-green and white chequering of the mature tree. A short avenue of *Cornus kousa chinensis* and *Chamaecyparis lawsoniana erecta-viridis*, with its bottle-green spires approaches the pines and there are many groups of deutzias, forsythias, philadelphus, daphne and viburnum, hybrid musk and floribunda roses with appropriate ground covers. Outstanding, in early July, are two large groups of the crimson *Diervilla* 'Bristol Ruby' with the tall canes of *Rosa pruhoniciana* (*hillieri*) rising above them, studded with blood-red flowers.

Beyond the pines are groups of floribunda roses set in a carpet of lavender, potentilla and many different herbs, leading into a small formal garden, surrounded by hedges of copper beech, *Ilex hodginsii*, and the silver-leaved sea-buckthorn. Rising above it are two large plane trees

and at the end is PALLAS ATHENE—a very fine early eighteenth-century Austrian baroque figure. A copy of the *Ariadne in Naxos* from Civita Alba is set into the wall on which the statue stands. The beds in the formal garden are edged with box and filled with the China rose 'Mme. Fabvier' and many coloured herbs.

The beds along the grass walk have only been planted for five years and are not yet grown-up. To the left, several acres of young roses and trees are visible, while to the right, the ground is broken by specimen trees towards the wood and is filled with drifts of young roses, choice shrubs and standard malus and cherries.

Just before the small formal garden at the end of the walk, there is a path leading back to the old wood. This was planted by the late HARRY WHITE some eighty years ago and contains some fine trees. It is at its most effective if seen from the grass walk, just before the *Pinus bungeana*. From here the long line of trees is beautifully balanced. The tall spires of *Libocedrus decurrens* and *Chamaecyparis lawsoniana erecta-viridis*, break the feathery tops of the deciduous trees. A short way behind are four or five redwoods and a wellingtonia like the masts of a sailing ship against the thickly wooded mound of Fireball Hill. Many of the trees in this line flower profusely in spring and colour brilliantly in autumn. There are large trees of *Aralia elata*, *Nothofagus obliqua*, *Acer platanoides schwedleri* and *A. pseudoplatanus leopoldii* and *Prunus avium florepleno*. Of particular note is *Cornus nuttallii*, some 26 feet high, in a very exposed position (Fig. 10) and *Halesia carolina* approaching 40 feet and with a considerable spread. This walk is under-planted with shrub roses and many foliage plants and amongst the larger shrubs are fine specimens of *Rosa roxburghii*, amelanchier and *Pyrus salicifolia pendula*. Near to the wood and a little way out from the border is a splendid pair of the weeping birch, *Betula pendula youngii* (Fig. 11).

Beyond this line of trees are many drifts of hydrangeas and choice shrubs, conifers and ericas and at the end of the erica drift is a remarkable group of *Nothofagus obliqua*, the southern beech. These trees are under forty years old from seed and have survived very low temperatures. The largest tree is over 80 feet in height and has a girth of 8 feet 9 inches at 5 feet from the ground. These trees seed freely and this would appear to be one of the fastest growing of deciduous trees for light, sandy soil.

The old wood itself fills the central section of the nursery and consists mostly of Scots fir planted immediately after the Napoleonic wars on the site of played-out gravel pits. This wood shelters an enormous collection of the species, the new and old hybrid rhododendrons and every sort of evergreen azalea. Japanese cherries, amelanchier and sorbus have been planted to give light shade and there is a splendid show of colour in a good spring. Amongst the shelter belts are many fine specimens. A large bush of *R. cinnabarinum roylei* from HOOKER'S 1849 seed is in good condition, although two very fine *R. thomsonii* from this sending have gone back sadly. There is a large plant of *R. fortunei*

'Mrs. Butler' and a fine bush of 'Loderi Sir Joseph Hooker', planted in 1913, and a large number of WILSON's rhododendrons from the original sendings, including a magnificent pair of *R. souliei* and a plant of *R. yunnanense*, which was brought as a seedling from China for Messrs. Veitch and given, at the dissolution of Coombe Wood, to HARRY WHITE. There is a large tree of *Magnolia campbellii* subsp. *mollicomata* and some very large plants of *Pieris japonica*. Below one of these grew a seedling, which appears to be a natural hybrid with *P. forrestii* and to have added all the brilliance of that species to the hardiness of *P. japonica*. This has been named 'Flame of the Forest'!

Parallel with the old wood runs the gravel hole itself, flanked by the drive to the office. Here there are fine magnolias and magnificent specimens of *Acer japonicum aureum* and *A. palmatum septemlobum*, an original plant of *Mahonia japonica* and a HOOKER seedling of *R. campanulatum*. Young trees of malus, cherries and sorbus shade the beds of evergreen azaleas, grasses and foliage plants.

At the foot of the gravel hole is a fine HOOKER plant of *R. cinnabarinum* and a long hedge of *mollis* azaleas, planted some fifty years ago. At right angles is a hedge of azaleas, *occidentalis* hybrids raised by the late HARRY WHITE. This ends in a huge bush of *Chimonanthus fragrans*, growing against a fine wooden barn and facing this are the office buildings with the Italian ground below them. Enclosed in this square are large plants of *Osmanthus delavayi* and *Eucryphia glutinosa* and a singularly beautiful tree of the golden-leaved catalpa.

The office buildings are approached through a very fine hedge of *Osmanthus ilicifolius* which produce a mass of tiny sweet-scented flowers during mild spells in the winter. There is a narrow court-yard here where many tender plants flourish. The crimson *Prunus mume* 'Beni-shi-don' flowers with great freedom and also the tender crimson *P. campanulata*. *Mutisia decurrens* flourishes on the wall and there are specimens of *Camellia reticulata* and *Arbutus menziesii*.

At the corner of the office is a small irregular-shaped terrace, where exotic succulents stand in the summer. Behind are bird-cages and some very fine shrubs; a really magnificent plant of *Acer palmatum dissectum atropurpureum*, two very large *Trochodendron aralioides* and a tall tree of *Nothofagus antarctica*.

Broad steps lead down to a lower terrace with a pool and a vista across to the new wood. The feeling here is French, the pool is at one end of the terrace and tall firs rise well above the house with its vertical white weather-boarding. The terrace is planted with large groups of yuccas, French roses and foliage plants (Fig. 4). Below the wall, a broad grass oval, flanked by yew hedges leads down to a pool. There are white statues against the hedge and a superb pair of marble urns above the pool. In the pool are a group of figures by the French sculptor GOOR. These were made in 'ciment fendu', as an experiment, to see if this material would withstand the English climate. Beyond the lawn is a grassy glade, merging into the new wood. This French garden cuts

across the Italian ground, the oldest surviving part of the nursery. No connection has ever been discovered to link it with Italy and it is surrounded by what were once known as American plants. This is a long strip of rich peaty soil, which curls past the old wood and on to the small wood, known as Land's End. In a good season, this is a flaming river of azalea and rhododendron blossom, nearly half-a-mile long. Below the office buildings are tremendous plants of Ghent azaleas and old hybrid rhododendrons and towards the end of May and early June, this can be one of the most astonishing sights in the country. The White Clodion urns and the dark line of the hedge, stand out against a great bank of the richest purple and flaring orange-buff. These are two original plants of rhododendron 'Royal Purple' and azalea 'Unique', which end the Italian ground. On the left is another group of 'Royal Purple', with the cream of azalea 'Daviesii' and a very fine plant of the rare *Kalmia myrtifolia*. To the right is a great hedge of azalea 'Standishi' and other Ghent azaleas interspersed with huge plants of rhododendrons 'Concessum', 'Fastuosum flore-pleno' and others of the same vintage. There is the original of R. 'Minny' which won the Gold Medal at Ghent in 1873, the plant of R. 'Blandyanum', which won the first prize at Chiswick in 1853 and the original of R. 'Delicatissimum'. Below these great shrubs is a tapestry of young plants in full flower.

Beside the Italian ground runs a small stream full of iron, which is the boundary between Surrey and Berkshire. On the Berkshire side is the new wood, which provides ideal ground along the stream for the cultivation of ferns and water-loving plants and on its higher levels are throwing beds for rhododendrons and many drifts of young rhododendrons and azaleas, especially the alpine species and smaller hybrids. A section of old Windsor bog here has proved impossible to drain, and is planted with all sorts of bog and water-loving plants. Various forms of *Iris laevigata*, the white and the yellow lysichitum and *Lilium superbum*, flourish especially. Many interesting ferns grow here and a clump of the graceful South-American bamboo, *Chusquea culeou*, has survived several cold winters.

On the drier ground above, is a narrow glade leading back to the main vista across to the office buildings (Fig. 3). This, and the small rise on the far side of the grass, are planted with a large collection of hybrid woodland rhododendrons and especially good colour forms of many of the species, and it is from these that all our stock is propagated from scions or cuttings, or, in the case of some of the species, by hand-pollinated seed.

There are fine plants of the pale yellow rhododendrons 'Idealist', 'Inamorata' and 'Josephine' here. The pale pink of 'Bonito' and groups of early-flowering hybrids, such as 'Carex' (Fig. 8). There are also many good colour forms of the Triflorum series, early reds such as *meddianum*, *strigillosum* and *beanianum*, and a large planting of the vivid yellow hybrid, 'Hawk'.

Many young trees are growing here and the graceful *Acer hersii* with weeping habit and fine snakebark is especially noticeable.

Photo, R. P. Scase

FIG. 1—*Agapetes macrantha* in the stove house at Wisley. A beautiful winter-flowering plant (see p. 4)

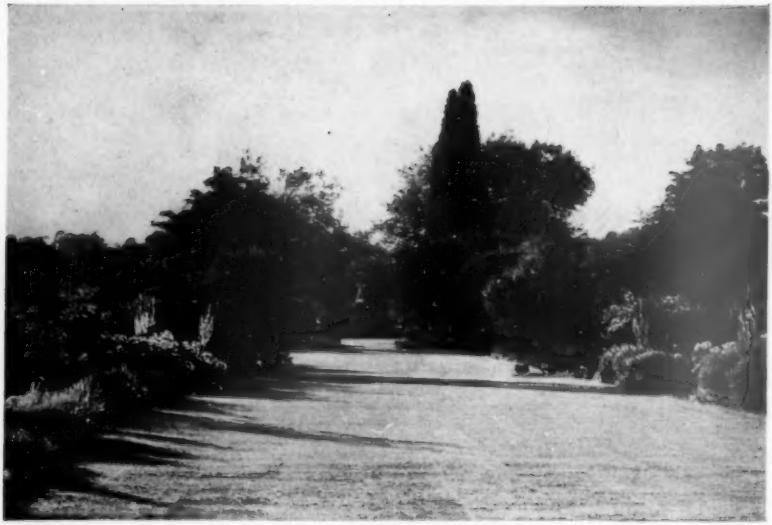
FIG. 2—The effect of wet (*above*) and dry (*below*) soil moisture regimes on early summer cauliflowers. The gaps show positions from which mature curds have been cut. Frequent watering has increased the quantity of foliage and the size of the curds, but has delayed maturity (SALTER'S experiment—see p. 7)

THE SUNNINGDALE NURSERIES

FIG. 3—A clearing in the New Wood devoted to stock plants of new rhododendrons and azaleas, looking towards the French Garden and the administrative buildings (see p. 22)

Photo: G. S. Thomas

FIG. 4—Begonias, yuccas and other foliage plants in the French Garden (see p. 21)



THE SUNNINGDALE NURSERIES

FIG. 5—The rose borders flank a long vista towards the statue of PALLAS ATHENE. Grey, green and purple foliaged shrubs and plants contrast with the dark column of *Libocedrus decurrens* and the pair of bushy *Pinus bungeana* (see p. 19)

Photos, G. S. Thomas

FIG. 6—Part of the shrub rose borders with 'Raubritter' in the foreground

THE SUNNINGDALE NURSERIES

FIG. 7—The drive towards the offices and packing department leads past brooms, maples, cistuses and magnolias (see p. 18)

Photo, G. S. Thomas

FIG. 8—Rhododendron 'Carex', one of the newer hybrids in this genus, in which the nursery specializes (see p. 22)

Photos, G. S. Thomas

THE SUNNINGDALE NURSERIES

FIG. 9—The long walk between old nursery display borders containing conifers, flowering trees, shrubs and plants

FIG. 10—*Cornus nuttallii*, the finest flowering Dogwood, a native of western North America. The inconspicuous flowers are surrounded by large creamy bracts which remain in beauty for many weeks (see p. 29)

containing conifers, flowering trees, shrubs and plants

native of western North America. The inconspicuous flowers are surrounded by large creamy bracts which remain in beauty for many weeks (see p. 20)

Photos, G. S. Thomas

THE SUNNINGDALE NURSERIES

FIG. 11—Two old specimens of YOUNG's Weeping Birch (see p. 20)

FIG. 12—Among the Scots pines of the Old Wood stands a fine specimen of *Acer japonicum aureum*, with a ground cover of thousands of Japanese azaleas in colourful rows

FIG. 13—*Verbascum dumulosum*. An unusually large plant in MR. DAVID SHACKLETON's garden at Clonsilla, near Dublin (see p. 26)

Photo, Eliot Hodgkin

FLOWERS OF THE CHINESE NEW YEAR

FIG. 14—*Narcissus tazetta* var. *orientalis*. A special dwarfed form known as "Crab's Claw" in Hong Kong (see p. 25)

Across the grass is a collection of colour forms of all the alpine rhododendrons, backed by Triflorums and various good forms of *wardii* and other yellow species, and this is at its best in April and early May.

Over the rise is a glade with a very large collection of all types of evergreen azaleas, ericaceous carpeters such as gaultheria and arctostaphylos and towards the stream is a slope planted with pieris and enkianthus, a large collection of *Rhododendron forrestii* forms and hybrids and many rare dwarf rhododendrons species, including some collected seedlings of *R. yakusimanum*. This rise is sheltered by Scots fir and many young trees have been planted amongst them. *Acer olivierianum* with its vivid yellow autumn colour, the deep pink-flowered *subhirtella* cherry 'Fukubana', *Betula ermannii*, *Arbutus menziesii*, *Nothofagus betuloides* and *Picea breweriana*. Around and beyond this area are large drifts of young rhododendron species and, in the richer ground below, young hybrids. A lot of the overhead shelter is provided by *Amelanchier laevis*, which is naturalized here and makes an extremely pretty effect in the spring.

At the end of the new wood, a bridge leads back into Surrey and to a stretch of ground towards the Devenish Road, which is devoted to paeony hybrids and species, the less usual herbaceous plants and a large collection of foliage plants. A fine line of trees runs along the edge of the brook here, containing many Douglas firs and a fine tree of *Chamaecyparis nootkatensis*. These date from the first half of the nineteenth century. At the far end of the nursery is a group of greenhouses used for the propagation of herbaceous plants and also for a small collection of unusual and beautiful conservatory plants, which can be maintained with little effort.

NOTES FROM FELLOWS

Flowers of the Chinese New Year

THE Chinese New Year occurs at the end of January or the beginning of February, the date being governed by the moon. I happened to be in Hong Kong for this festival this year, and very colourful it is, as well as noisy, for the bangs of the Chinese crackers continue without interruption, like the rat-tat-tat of a machine-gun, for the space of two days. Just as we associate holly with Christmas, so the Chinese have their special New Year flowers. In Hong Kong there are three: the Hanging Bellflower, the Pink-flowered Peach and the Sacred Lily. Of these, only the first grows wild in the Colony: it is *Enkianthus quinqueflorus*, which has small bell-shaped pink flowers. It was so widely picked for sale at the fair that precedes Chinese New Year that it has had to be protected. The peach (*Prunus persica*) is grown by nurserymen, but most of the plants are imported from the mainland. At the fair, which is held in the streets three days before New Year, peach trees are on sale in

large numbers. Each tree, which may be anything from 3 feet to 15 feet high, is cut off just above ground level and the branches carefully tied in. All are brought to market in bud, ready to burst into bloom on New Year's Day and much care and skill is needed to bring them to this state at the right moment, but the Chinese are past masters in this art.

The third, and most interesting, festival flower is the Sacred Lily. This is a form of *Narcissus tazetta*, to which BAILEY has given the varietal name of *orientalis*. It is popularly known throughout Southern China and Hong Kong as the Water Nymph Flower. There are two main forms, one with single and the other with double flowers. There are also fancy forms, one of which has short stalks, resulting in the flower heads being massed together in a large cluster. Some of these are rare and command high prices.

Although the exacting art of forcing the bulbs is carried out in Hong Kong, the growing of them for the whole of South China is confined to a few villages in a very small district to the east of the Yellow Mountain near Changchow in South Fukien. The cultivation of these bulbs is the villagers' main source of livelihood, and is a lucrative one. It is probable that others have tried their hand at it, but have failed, leaving these villagers with a monopoly. The method of cultivation is briefly as follows: The bulbs are grown in a dark rich loam of high fertility. They are stored until the first day of the ninth lunar month (October); after a soaking in water for an hour, they are planted out in raised beds with their necks just below the surface. There they remain for the next nine months, being fed from time to time with liquid pig manure. At the end of the fifth lunar month (June) they are lifted and dried off. The dead leaves are removed, the roots trimmed off, and the depression at the base of the bulb plastered with black mud. The bulbs are stored under cover on a clay floor, base downwards, between thick layers of rice straw. This routine is followed for three successive years, when they are ready for marketing. They are graded into eight different sizes and packed into cylindrical baskets. In the tenth and eleventh lunar months (November and December) they arrive in Hong Kong. All must be sold one month before Chinese New Year so that they can be forced in time. Any left over are unsaleable.

Successful forcing requires great skill and experience, for to obtain a profit the forcer must bring his bulbs to the correct state of bloom in the last hours of the old lunar year when the demand is greatest and prices are at their height. The first step is to peel off the dry outer scales, then deep incisions are made on each side of each growing point, so partially splitting the bulbs into several sections. The bulbs are plunged in water overnight to dissolve the sticky juice exuded from the incisions. Next day they are placed close together in shallow trays with about an inch of water at the bottom. These trays have a bung in them so that the water can be carefully changed without injuring the fragile roots; this is done once or twice a day. If the day is sunny, light shading is put over them and the plants moistened up to six times a day. Should there be too

much cloudy weather, growth has to be artificially stimulated by taking the bulbs indoors at night and giving them a steam-heating treatment. Daily attention has to be given to keep the plants clean and tidy, and as the flowers open the ensheathing membranes are removed with a pair of forceps.

The fancy, dwarfed forms are produced by a process known as "carving". This art has been highly developed in Amoy, where plants are trained to take the shape of animals when in bloom. But in Hong Kong only one fancy form is grown and is called "Crab's Claw". The plant illustrated (Fig. 14) was photographed on the eve of Chinese New Year in the Botanic Gardens in Hong Kong. The bowl contained five bulbs artificially mutilated to cause dwarfing of the leaves and the flower stem. A large portion of the scale tissue is cut away to expose the central bud. The bulbs are grouped in a circle with the cut sides uppermost and tied together with bamboo strips. A small dome of bamboo strips is built over the hollow centre, and covered with a layer of damp cotton. They are then laid in the clay bowl which is filled with water.

As the bulbs grow, dwarfing is continued by further removal of tissue, and the flower stems are carefully trained to form a dense central cluster. It will be seen that the leaves are spirally coiled. This is achieved by the daily removal of a minute portion of the edge of each leaf, which causes unequal growth.

One can but marvel at the skill and many hours of patient work that go to produce these fantasies; whether they are justified by the results is another question.

I am indebted to MR. DEANE, Superintendent of the Hong Kong Botanic Gardens, for introducing me to the Sacred Lily; and to the writer of the article in Bulletin No. 3 (1953) of the Hong Kong Department of Agriculture, Fisheries and Forestry, on which this note is based.

ELIOT HODGKIN

Autumn-Fruiting Strawberries in South-West Scotland

I decided to try some autumn-fruiting varieties of strawberries in order to have some strawberries for eating during the school summer holidays after the normal varieties were finished. Accordingly in the autumn of 1956 I bought a dozen plants of each of the following sorts: 'Sans Rivale', 'St. Claude' and 'Triomphe'.

The soil here is light sandy loam, rather shallow over rock. The climate is mild, with little snow in winter but usually some weeks of frost, often in February or March. The rainfall is about 34 to 36 inches in a year on the average, but this year it has, as everywhere, been unevenly distributed. The rain gauge here has read as follows: April, 1·4 inches; May, 3·6 inches; June, 1·2 inches; July, 5·6 inches; August, 2·8 inches; and September, 5·1 inches.

The strawberries all survived the winter and started to flower at the beginning of summer, but in accordance with instructions from the

suppliers I removed the first blossoms. Soon after this the dry weather started and during June the soil became completely dry and the strawberries made very little growth and no more blossom appeared. Until well into July there was virtually no fruit at all and I had rather written the strawberries off as a complete failure.

As soon, however, as the wet weather started in July they all made plenty of growth and flowered profusely. Towards the end of the month there was a lot of fruit and this has continued through August, September and right up to the present time, the middle of October. I have gathered a bowl of fruit every few days and even picked a small bowl today (October 14). Towards the end of September I put some cloches over them but find that they do better without them. In the prevailing dampness the fruit tends to go mouldy under the cloches and also they seem to attract every slug in the neighbourhood.

Of the three varieties I have tried I find that 'Sans Rivale' is very much the best. It has produced masses of fruit and the flavour is first rate. It seems much better in flavour than the usual strawberries, but this may possibly be due to the fact that, being out of season, it appears better than it really is. The fruits are small, many not bigger than an alpine strawberry, but quantity makes up for lack of size. 'Triomphe' has larger fruits of a flat shape, but it is by no means so prolific and the fruits seem to be unusually soft, so that they mostly go bad and rot in the centres. 'St. Claude' is a weaker grower and has fruited much less than the other two varieties; the fruit is small and very sweet, but it is much inferior both in quantity and quality compared with 'Sans Rivale'. Based on the experience of a single year, and that a peculiar one from a weather point of view, there is no doubt whatever that 'Sans Rivale' has lived up to its name and it will be most interesting to note if next year confirms this as I am leaving all three rows in for another year in order to test this.

I am satisfied that the experiment has been well worth while and I can recommend a trial of these strawberries to anyone with children who are away at school in June and July but at home in August and September. I can say with certainty that there will be no objections on the ground that the berries are on the small side.

J. DOUGLAS BROWN

Kirkcudbright,
Scotland.

Verbascum dumulosum

Verbascum dumulosum was collected by DR. PETER DAVIS in the Taurus Mountains of Anatolia in 1952. The plant in Fig. 13 now some 6 feet in diameter and 15 inches tall is three and a half years old and growing in an indoor rock garden. This verbascum has not yet been tried in the open as the foliage being heavily tomentose it might succumb to our wet winters in Ireland, but growing in well-drained conditions in full

sun in the drier counties of England it should survive as it appears to be perfectly hardy.

The flowers, typical verbascum in appearance, are yellow in colour and produced in profusion throughout the summer. Propagation from cuttings is not difficult in a sand frame during the early autumn from non-flowering shoots.

Clonsilla,
Co. Dublin,
Eire.

DAVID SHACKLETON

SMALL EXHIBIT OF SOUTH AFRICAN FLOWERS

At the Society's Fortnightly Show on November 5–6, 1957, a small exhibit of five vases of South African native flowers was sent by MRS. B. S. PESCHEL, 127 Juta St. East, Wanderers, Johannesburg. These were sent by air freight and arrived in unusually good condition considering that some of the material consisted of flowers with thick, rather succulent stems. There were two vases of a good, deep pink form of the arum, *Zantedeschia rehmannii*, and an interesting specimen of the handsome *Cyrtanthus obliquus*, whose pendulous, tubular flowers were reddish orange, flushed yellowish green towards the mouth of the corolla. Each of these flowers was packed in a separate small glass tube about 5–6 inches long containing a little water, the tube being only a very little larger than the diameter of the stem. These tubes were fastened in a cardboard box. Also included were two vases of the unusual Proteaceous flowers, *Leucospermum reflexum* and *L. nutans*; both were pinkish orange in colour and the flower heads were like globular pincushions. It is always particularly interesting to Fellows to be able to see flowers from other countries and we are grateful to those who take the trouble to send them.

WISLEY TRIALS, 1957

ARCTOTIS

Four stocks of arctotis were received for trial at Wisley in 1956. The trial was inspected by a sub-committee of the Floral Committee A on July 30, 1956, August 1 and 9, 1957, and on its recommendation the Council of The Royal Horticultural Society has made the following award to an arctotis. The number in brackets after the description of the variety was that under which it was grown in the trial.

SUTTON'S SPECIAL HYBRIDS. (Raised, introduced and sent by Messrs. Sutton & Sons Ltd., Reading, Berks.) **A.M.** August 9, 1957. Plant 20 to 22 inches tall, 15 inches across, vigorous, erect, bushy and leafy habit;

flower stems 19 inches long, stout, rigid; flowers 3 inches diameter, freely produced, single; petals 1½ inches long, $\frac{3}{10}$ inch wide; mixed colours, white, pale orange, bright orange, rose, pink and white. [4]

ANNUAL COREOPSIS

Twelve stocks of annual coreopsis were received for trial at Wisley. These were sown in the open where they were intended to flower, on April 5, 1957, in rows 1½ feet apart, the plants being finally thinned to 12 inches apart in the row.

The trial was inspected by a sub-committee of the Floral Committee A on August 9 and 19, 1957, and on its recommendation the Council of The Royal Horticultural Society has made the following awards to annual coreopsis.

The number in brackets after the description of the variety was that under which it was grown in the trial.

BEAUTY. (Sent by Messrs. Watkins & Simpson Ltd., 26/29 Drury Lane, Covent Garden, London, W.C.2.) **A.M.** August 9, 1957. Plant 22 inches tall, 18 inches wide, vigorous, erect, bushy and compact habit, flowering freely; flowers 1¾ inches diameter, single; petals ¾ inch long, ⅜ inch wide, cut, Saffron Yellow (H.C.C. 7) with a fairly large blotch of Indian Lake (H.C.C. 826/1) at base. [2]

CRIMSON KING. (Sent by Messrs. Watkins & Simpson Ltd.) **A.M.** August 9, 1957. Plant 20 to 24 inches tall, 18 inches wide, vigorous, erect, bushy and compact habit, flowering freely; flowers 1¼ inches diameter, single; petals ¾ inch long, ⅜ inch wide, cut, a deep rich velvety colour near Garnet Brown (H.C.C. 00918). [7]

FIRE KING. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd.) **A.M.** August 19, 1957. Plant 20 inches tall, 18 inches wide, vigorous, erect, bushy and compact habit, flowering freely; flowers 1¼ inches diameter, single; petals ½ inch long, ¼ inch wide, cut, a rich velvety colour near Oxblood Red (H.C.C. 00823). [9]

GARNET. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd.) **A.M.** August 19, 1957. Plant 26 inches tall, 18 inches wide, vigorous, erect, bushy and compact habit, flowering very freely; flowers 1¾ to 2¼ inches diameter, single; petals ⅝ inch long, ⅜ inch wide, cut, a dark red near Chrysanthemum Crimson (H.C.C. 824) with dark eye. [8]

GOLDEN CROWN. (Sent by Messrs. Watkins & Simpson Ltd.) **A.M.** August 9, 1957. Plant 36 to 39 inches tall, 30 to 36 inches wide, vigorous, slightly spreading habit, flowering freely; flowers 2¾ to 3¼ inches diameter, semi-double; petals 1¼ inches long, 1½ inches wide, deeply cut, Indian Yellow (H.C.C. 6) with a blotch of Indian Lake (H.C.C. 826) at base of petal and a very dark almost black eye. [12]

HEMEROCALLIS

The Council of The Royal Horticultural Society has made the following awards to hemerocallis after trial at Wisley, on the recommendation of the Floral Committee A.

The number in brackets after the description of the variety was that under which it was grown in the trial.

AMBASSADOR. (Raised by Kenneth D. Smith, Esq., Benedict Road, Damegan Hills, Staten Island 4, New York, U.S.A., and sent by H. J.

Randall, Esq., C.B.E., Sandilands, Brooklyn Road, Woking, Surrey.) **A.M.** July 12, 1957. Described R.H.S. JOURNAL, 82, p. 34 (**H.C.** 1956). [35]

LADY LAWRENCE. (Raised by the late Amos Perry, introduced and sent by Messrs. Perry's Hardy Plant Farm, Enfield, Middlesex.) **H.C.** July 12, 1957. Plant 30 inches high, vigorous, forming dense tufts; foliage 30 inches long, 1½ inches wide; flower stems 42 inches long, eleven to fifteen flowers per stem; flowers 4¼ inches diameter, 2¼ inches long, a shade near Spanish Orange (H.C.C. 010/2), veined and flushed rose at throat. [1]

PERENNIAL PHLOX

Seventy-three stocks of perennial phlox were received for trial at Wisley in 1956. The trial was inspected by a sub-committee of the Floral Committee A on August 8 and 22, 1956, July 12 and 19, 1957, and on its recommendation the Council of The Royal Horticultural Society has made the following awards to perennial phlox.

The number in brackets after the description of the variety was that under which it was grown in the trial.

VINTAGE WINE. (Raised by Capt. B. Symons-Jeune, introduced and sent by Messrs. Bakers Nurseries Ltd., Codsall, Wolverhampton, Staffs.) **F.C.C.** July 19, 1957. Plant 4 feet tall; flower stems 3¾ feet long, medium size; panicles 9 to 12 inches long, 14 inches wide, fairly compact, freely produced; flowers 1⅜ inches diameter, petals flat, a slightly brighter shade of Orchid Purple (H.C.C. 31); eye Rose Red (H.C.C. 724). [59]

B. SYMONS JEUNE. (Raised by Capt. B. Symons-Jeune, introduced by Messrs. Bakers Nurseries Ltd., sent by Mr. Stuart Ogg, Grove Nurseries, Swanley, Kent.) **A.M.** July 12, 1957. Plant 3½ feet tall; flower stems 3¼ feet long, stout; panicles 10 inches long, 10 to 12 inches wide, compact, freely produced; flowers 1½ inches diameter, slightly cupped, Magenta (H.C.C. 27/3); eye Magenta (H.C.C. 27/1). [77]

ELSTEAD PINK. (Sent by Messrs. Thomas Carlile (Loddon Nurseries Ltd.), Carlile's Corner, Twyford, Berks.) **A.M.** July 12, 1957. Plant 3½ feet tall; flower stems 3 feet long, stout; panicles 9 inches long, 12 inches wide, compact, very freely produced; flowers 1⅜ inches diameter, petals flat, Fuchsine Pink (H.C.C. 627/2); eye Magenta (H.C.C. 27/1). [24]

FAIRY'S PETTICOAT. (Raised by Capt. B. Symons-Jeune, introduced and sent by Messrs. Bakers Nurseries Ltd.) **A.M.** July 19, 1957. Plant 4¼ ft. tall; flower stems 4 feet long, very stout; panicles 8 inches long, 10 to 11 inches wide, compact, very freely produced; flowers 4⅛ inches diameter, petals flat, Pastel Mauve (H.C.C. 433/2). [62]

HAREWOOD. (Raised by Mr. F. M. Simpson, Pool Road Gardens, Otley, Yorks., introduced and sent by Messrs. R. H. Bath Ltd., The Floral Farms, Wisbech, Cambs.) **A.M.** July 12, 1957. Plant 3½ feet tall; flower stems 3 feet long, slender; panicles 8 to 10 inches long, 12 inches wide, fairly compact, freely produced; flowers 1½ inches diameter, petals flat, a shade near Tyrian Rose (H.C.C. 24/1), changing to Magenta (27/2) at eye. [34]

OLIVE WELLS DURRANT. (Raised by Capt. B. Symons-Jeune, introduced and sent by Messrs. Bakers Nurseries Ltd.) **A.M.** July 12, 1957. Plant 4 to 4½ feet tall; flower stems 3¾ feet long, stout; panicles 8 inches long, 10 to 12 inches wide, compact, very freely produced; flowers 1 3/16 inches diameter, petals flat, Rose Pink (H.C.C. 427/1); eye Magenta (H.C.C. 27/1). [14]

RON CARTER. (Raised, introduced and sent by Messrs. A. Goatcher & Son, The Nurseries, Washington, nr. Pulborough, Sussex.) **A.M.** July 12, 1957. Plant 3¾ feet tall; flower stems 3½ feet long, stout; panicles 8 to 10 inches long, 9 inches wide, compact, freely produced; flowers 1⅜ inches diameter, petals flat, Rose Madder (H.C.C. 23); eye Magenta (H.C.C. 27). [54]

SIR JOHN FALSTAFF. (Sent by Messrs. Wallace & Barr, The Old Gardens, Tunbridge Wells, Kent.) **A.M.** July 19, 1957. Plant 4 feet tall; flower stems 3½ to 4 feet long, medium size; panicles 8 to 10 inches long, 12 inches wide, very compact, freely produced; flowers 1⅜ inches diameter, petals flat, Neyron Rose (H.C.C. a shade between 623 and 623/1); eye Magenta (H.C.C. 27). [17]

STIRLING. (Raised by Mr. F. M. Simpson, introduced and sent by Messrs. R. H. Bath Ltd.) **A.M.** July 12, 1957. Plant 4 feet tall; flower stems 3½ feet long, stout; panicles 8 inches long, 12 inches wide, compact, freely produced; flowers 1½ inches diameter, petals flat, a clear bright shade near Carmine (H.C.C. 21/1); eye Solferino Purple (H.C.C. 26), surrounded by Magenta (H.C.C. 27/2). [36]

TURANDOT. (Sent by Messrs. Wallace & Barr.) **A.M.** July 19, 1957. Plant 3½ feet tall, flower stems 3¼ feet long, stout; panicles 9½ inches long, 10 inches wide, compact, freely produced; flowers 1 3/16 inches diameter, petals flat, Tyrian Purple (H.C.C. 727), slightly deeper at eye. [65]

WINDSOR. (Raised by Mr. F. M. Simpson, introduced and sent by Messrs. R. H. Bath Ltd.) **A.M.** July 19, 1957. Plant 3¾ feet tall; flower stems 3¼ feet long, stout; panicles 8 to 10 inches long, 14 inches wide, compact, freely produced; flowers 1⅜ inches diameter, petals flat, a clear shade of Carmine (H.C.C. 21/1); eye Magenta (H.C.C. 27). [35]

DUCHESS OF YORK. (Sent by Messrs. Thomas Carlile (Loddon Nurseries Ltd.).) **H.C.** July 19, 1957. Plant 3¾ feet tall; flower stems 3½ feet long, medium size; panicles 9 inches long, 10 to 12 inches wide, compact, freely produced; flowers 1½ inches diameter, petals flat, a clear shade of Phlox Pink (H.C.C. 625/1); eye white at centre. [8]

FANAL. (Sent by Messrs. Wallace & Barr.) **H.C.** July 19, 1957. Plant 3½ feet tall; flower stems 3 feet long, stout; panicles 6 to 8 inches long, 10 to 12 inches wide, compact, very freely produced; flowers 1 1/16 inches diameter, petals flat, Rose Red (H.C.C. 724). [39]

HOLYROOD. (Raised by Mr. F. M. Simpson, introduced and sent by Messrs. R. H. Bath Ltd.) **H.C.** July 19, 1957. Plant 3 feet tall; flower stems 2¾ feet long, medium size; panicles 6 to 8 inches long, 10 inches wide, fairly compact, freely produced; flowers 1⅜ inches diameter, petals flat, a shade of Carmine (H.C.C. between 21 and 21/1); eye Tyrian Purple (H.C.C. 727). [37]

JOAN. (Raised by Capt. B. Symons-Jeune, introduced and sent by Messrs. Bakers Nurseries Ltd.) **H.C.** July 19, 1957. Plant 3¼ feet tall; flower stems 3 feet long, medium size; panicles 6 to 8 inches long, 10 to 12 inches wide, compact, freely produced; flowers 1½ inches diameter, petals flat, a clear pink near Carmine (H.C.C. 21/1); eye Magenta (H.C.C. 27). [48]

TORCH. (Raised by Capt. B. Symons-Jeune, introduced and sent by Messrs. Bakers Nurseries Ltd.) **H.C.** July 19, 1957. Plant 4¼ feet tall; flower stems 3¾ feet long, stout; panicles 6 to 8 inches long, 10 to 12 inches wide, compact, freely produced; flowers 1⅜ inches diameter, petals flat,

a colour very near Neyron Rose (H.C.C. 623), eye Rhodamine Purple (H.C.C. 29). [46]

ANNUAL SCABIOUS

Ten stocks of annual scabious were received for trial at Wisley. These were sown under glass on February 1, 1957, the resulting seedlings being planted in the open on May 16, 1957, in rows 2½ feet apart; each plant being spaced 15 to 18 inches apart in the row.

The trial was inspected by a sub-committee of the Floral Committee A on August 8, 1957, and on its recommendation the Council of The Royal Horticultural Society has made the following awards to annual scabious.

The number in brackets after the description of the variety was that under which it was grown in the trial.

AZURE FAIRY IMPROVED. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd., 26–29 Drury Lane, Covent Garden, London, W.C.2.) **A.M.** August 9, 1957. Plant 3 feet tall, very vigorous, erect, very compact and branching habit; flower stems 14 to 18 inches long, wiry, slender, rigid; flowers 2¾ to 3 inches diameter, double, Veronica Violet (H.C.C. a shade between 639 and 639/1). [6]

CORAL PINK. (Sent by Messrs. Watkins & Simpson Ltd.) **A.M.** August 9, 1957. Plant 3 to 3½ feet tall, vigorous, erect, compact and branching habit; flower stems 16 to 18 inches long, wiry, very slender; flowers 2¾ inches diameter, double, Carmine (H.C.C. 21) when first open, changing later to Carmine (H.C.C. 21/1) and becoming paler towards edges of petals. [2]

PARMA VIOLET. (Raised, introduced and sent by Messrs. Watkins & Simpson Ltd.) **H.C.** August 9, 1957. Plant 3 feet tall, vigorous, erect, compact and branching habit; flower stems 14 to 18 inches long, wiry, medium size; flowers 2⅝ inches diameter, double, Aster Violet (H.C.C. between 38 and 38/1). [7]

SILVER MOON. (Raised, introduced and sent by Messrs. Bodger Seeds Ltd., Box 390, El Monte, California, U.S.A.) **H.C.** August 9, 1957. Plant 3 to 3½ feet tall, vigorous, erect, branching habit; flower stems 18 to 20 inches long, wiry, very slender; flowers 2½ to 2¾ inches diameter, double, white. [1]

SWEET PEAS

Seventy-two stocks of sweet peas were received at Wisley in the autumn of 1956. These, with fifty control varieties, were sown in boxes on October 10, 1956. The resulting seedlings were potted into 3-inch pots on November 12 and the pots were plunged in ashes in a cold frame for the winter. In the spring the plants were gradually hardened off in preparation for planting out, which took place on March 20, 1957. Twelve plants of each stock were planted and these were naturally grown up hazel sticks. During the winter of 1956–7, the site was prepared by double digging strips 4 feet wide leaving a 2-foot-wide path between each cultivated strip. The rows of plants were then sited down the middle of the cultivated portion. Farmyard manure was incorporated into the bottom spit at the rate of four barrow-loads per 12-yard run of trench. In both the top and the bottom spits 2 lb. of bone meal and 2 lb. of dried seaweed manure were applied to each 12-yard run of trench. After planting, a dressing of peat was worked into the top 2 inches of soil round the plants.

The Joint Sweet Pea Committee of The Royal Horticultural Society and The National Sweet Pea Society inspected the trial on June 19, 1957, and on its recommendation The Royal Horticultural Society and The National Sweet Pea Society have made jointly the following awards to sweet peas.

The number in brackets after the description of the stock was that under which it was grown in the trial.

BLUE BEE. (Raised and sent by Messrs. W. Atlee Burpee Co., Burpee Building, Hunting Park Avenue, at 18th Street, Philadelphia 32, U.S.A.) **A.M.** June 19, 1957. Plant 5½ feet high, vigorous; flower stem 10 to 12 inches long, stiff, an average of five flowers per stem. Flowers 2⅛ inches across, 1⅝ inches deep, fairly well spaced, standards slightly reflexed and much waved, Veronica Violet (H.C.C. 639/2), overlaid Campanula Violet (H.C.C. 37/2), wings spreading and much waved, Veronica Violet (H.C.C. 639); scent fairly strong. [14]

FROLIC. (Raised and sent by Messrs. W. Atlee Burpee Co.) **A.M.** June 19, 1957. Plant 5¾ feet high, vigorous; flower stem 10 to 12 inches long, stiff, an average of four flowers per stem. Flowers 2⅛ inches across, 1½ inches deep, well spaced, standards reflexed and waved, wings spreading and waved, cream, delicately veined and tinged at edges with Mallow Purple (H.C.C. 630/2), keel deep cream; scent strong. [52]

ICE CREAM. (Raised and sent by Messrs. W. Atlee Burpee Co.) **A.M.** June 19, 1957. Plant 5½ feet high, vigorous; flower stem 10 to 12 inches long, stiff, an average of four flowers per stem. Flowers 1$\frac{9}{10}$ inches across, 1¼ inches deep, well spaced, standards reflexed and much waved, wings spreading and much waved, cream, buds Naples Yellow (H.C.C. 403/3); scent strong. [58]

JOYFUL. (Raised and sent by Messrs. W. Atlee Burpee Co.) **H.C.** June 19, 1957. Plant 5½ feet high, vigorous; flower stem 10 to 12 inches long, fairly stiff, an average of four flowers per stem. Flowers 1$\frac{9}{10}$ inches across, 1¼ inches deep, well spaced, standards slightly reflexed and waved, wings spreading and waved, ground cream, veined and tinged Fuchsine Pink (H.C.C. 627/1); scent strong. [22]

KING'S RANSOM. (Raised and sent by Messrs. E. W. King & Son Ltd., Coggeshall, Colchester, Essex.) **H.C.** June 19, 1957. Plant 6½ feet high, vigorous; flower stem 12 to 14 inches long, stiff, an average of four flowers per stem. Flowers 2$\frac{1}{10}$ inches across, 1¼ inches deep, well spaced, standards reflexed and waved, Cyclamen Purple (H.C.C. 30/1), wings spreading slightly waved, Orchid Purple (H.C.C. 31/1), keel white, slightly tinged purple; scent fairly strong. [2]

ROSE GLEAM. (Raised and sent by Messrs. W. Atlee Burpee Co.) **H.C.** June 19, 1947. Plant 5 to 5½ feet high, vigorous; flower stem 10 to 12 inches long, stiff, an average of four flowers per stem. Flowers 2⅛ inches across, 1¼ inches deep, fairly well spaced, standards slightly reflexed and much waved, Fuchsine Pink (H.C.C. 627/2), wings spreading and much waved, Fuchsine Pink (H.C.C. 627), keel cream, tinged Fuchsine Pink (627/2); scent fairly strong. [32]

Cupid Cuthbertson sweet peas

The same cultivation was given to the dwarf growing stocks of this type as for the taller varieties except that the plants were supported with short twiggy pea boughs to keep the lower flowers above soil level.

BLOSSOM CARPET. (Raised and sent by Messrs. Ferry-Morse Seed Co., P.O. Box 967, Mountain View, California, U.S.A.) **H.C.** June 19, 1957. Plant 8 to 10 inches high, vigorous; flower stem 3 inches long, stiff, an average of three flowers per stem. Flowers 1⅝ inches across, 1¼ inches deep, closely spaced, standards slightly reflexed and waved, Fuchsine Pink (H.C.C. 627/1), veined Fuchsine Pink (H.C.C. 627), wings spreading and waved, Fuchsine Pink (H.C.C. 627/3), veined Fuchsine Pink (H.C.C. 627/1); scent slight. [63]

BLUSH CARPET. (Raised and sent by Messrs. Ferry-Morse Seed Co.) **H.C.** June 19, 1957. Plant 8 to 10 inches high, vigorous; flower stem 3½ inches long, stiff, an average of three flowers per stem. Flowers 1⅝ inches across, 1⅛ inches deep, closely spaced, standards slightly reflexed and much waved, wings spreading and waved, ground white, veined and overlaid at margins with Mallow Purple (H.C.C. 630/1); scent fairly strong. [65]

CARMINE CARPET. (Raised and sent by Messrs. Ferry-Morse Seed Co.) **H.C.** June 19, 1957. Plant 9 to 12 inches high, vigorous; flower stem 3½ to 4 inches long, stiff, an average of three flowers per stem. Flowers 1½ inches across, 1$\frac{1}{10}$ inches deep, closely spaced, standards slightly reflexed and waved, wings spreading and much waved, Rose Bengal (H.C.C. 25/1); scent slight. [71]

CERISE CARPET. (Raised and sent by Messrs. Ferry-Morse Seed Co.) **H.C.** June 19, 1957. Plant 10 to 12 inches high, vigorous; flower stem 3 inches long, stiff, an average of three flowers per stem. Flowers 1⅝ inches across, 1⅛ inches deep, closely spaced, standards slightly reflexed and waved, wings spreading and waved, a slightly clearer shade of Geranium Lake (H.C.C. 20/1); scent fairly strong. [61]

CREAM CARPET. Raised and sent by Messrs. Ferry-Morse Seed Co.) **H.C.** June 19, 1957. Plant 10 inches high, vigorous; flower stem 3 inches long, stiff, an average of three flowers per stem. Flowers 1⅝ inches across, 1 inch deep, closely spaced, standards slightly reflexed and much waved, wings spreading and slightly waved, cream; no scent. [70]

CRIMSON CARPET. Raised and sent by Messrs. Ferry-Morse Seed Co.) **H.C.** June 10, 1957. Plant 9 to 12 inches high, vigorous; flower stem 3 inches long, stiff, an average of three flowers per stem. Flowers 1½ inches across, 1¼ inches deep, well spaced, standards slightly reflexed and waved, wings spreading and waved, near Chrysanthemum Crimson (H.C.C. 824/3), veined slightly deeper colour; scent slight. [62]

LAVENDER CARPET. (Raised and sent by Messrs. Ferry-Morse Seed Co.) **H.C.** June 19, 1957. Plant 8 inches high, vigorous; flower stem 3 inches long, stiff, an average of three flowers per stem. Flowers 3$\frac{3}{10}$ inches across, 1 inch deep, fairly closely spaced, standards slightly reflexed and much waved, wings spreading and much waved, Cobalt Violet (H.C.C. 634/3), veined Cobalt Violet (H.C.C. 634/1); scent strong. [72]

PINK CARPET. (Raised and sent by Messrs. Ferry-Morse Seed Co.) **H.C.** June 19, 1957. Plant 12 to 14 inches high, vigorous; flower stem 3½ to 4 inches long, stiff, an average of three to four flowers per stem. Flowers 1⅝ inches across, 1¼ inches deep, well spaced, standards flat and slightly waved, Fuchsine Pink (H.C.C. 627/2), wings much waved, Fuchsine Pink (H.C.C. 627/1); scent fairly strong. [66]

ROSE CARPET. (Raised and sent by Messrs. Ferry-Morse Seed Co.) **H.C.** June 19, 1957. Plant 8 inches high, vigorous; flower stem 3¼ inches long, stiff, an average of two flowers per stem. Flowers 1$\frac{9}{10}$ inches across,

1⅜ inches deep, well spaced, standards slightly reflexed and much waved, Rose Bengal (H.C.C. 25), wings spreading and waved, Solferino Purple (H.C.C. 26); scent slight. [60]

WHITE CARPET. (Raised and sent by Messrs. Ferry-Morse Seed Co.) **H.C.** June 19, 1957. Plant 12 inches high, vigorous; flower stem 3 inches long, stiff, an average of three flowers per stem. Flowers 1½ inches across, 1 inch deep, closely spaced, standards much waved, wings spreading and waved, clear white; scent fairly strong. [68]

VERBENAS

Thirty stocks of verbenas were received for trial at Wisley in 1957. The trial was sown under glass on February 4, 1957, and the resulting seedlings were planted out in the open on May 15, 1957. The trial was inspected on July 19, 25, August 1 and 9, 1957, by a sub-committee of the Floral Committee A and on its recommendation the Council of The Royal Horticultural Society has made the following awards to verbenas.

The number in brackets after the description of the variety was that under which it was grown in the trial.

CRYSTAL. (Raised, introduced and sent by Messrs. Denholm Seed Co., 2342, Sawtelle Boulevarde, Los Angeles 64, California, U.S.A.) **A.M.** August 1, 1957. Plant 10 to 12 inches tall, 10 to 12 inches wide, very vigorous, bushy dense habit; flower stems 6 to 12 inches long, medium thickness, rigid; inflorescence 2 inches diameter, 1⅛ inches deep, compact, very freely produced; flower ⅞ inch diameter, single, white with greenish yellow eye; scent strong. [1]

DELIGHT. (Raised, introduced and sent by Messrs. Denholm Seed Co.) **A.M.** August 1, 1957. Plant 10 to 12 inches tall, 12 inches wide, vigorous, bushy very dense habit; flower stems 6 to 12 inches long, medium thickness, rigid; inflorescence 2¼ inches diameter, 1½ inches deep, compact, very freely produced; flower $\frac{7}{10}$ inch diameter, single, Neyron Rose (H.C.C. between 623 and 623/1); scent strong. [2]

SPARKLE. (Introduced and sent by Messrs. L. Clause, S.A., Bretigny-sur-Orge, France.) **A.M.** August 1, 1957. Plant 10 to 13 inches tall, 12 inches wide, vigorous, bushy habit; flower stems 8 to 12 inches long, medium thickness, rigid; inflorescence 2½ inches diameter, 1 inch deep, compact, very freely produced; flower $\frac{7}{10}$ inch diameter, single, Orient Red (H.C.C. 819/1) with greenish white eye; scent strong. [6]

SPARKLE MIXED. (Raised, introduced and sent by Messrs. Denholm Seed Co.) **A.M.** August 1, 1957. Plant 9 to 15 inches tall, 18 inches wide, vigorous, bushy habit; flower stems 8 to 12 inches long, medium thickness, rigid; inflorescence 2 inches diameter, 1 inch deep, compact, freely produced; flower ⅞ inch diameter, single, mixed colours, white, pale pink, scarlet, purple, violet mauve, cerise, scarlet with white eye, cerise with white eye, purple with white eye; scent strong. [7]

WHITE. (Raised, introduced and sent by Messrs. Bodger Seeds Ltd., Box 390, El Monte, California, U.S.A.) **A.M.** August 9, 1957. Plant 12 to 15 inches tall, 24 inches wide, very vigorous, very erect and compact habit; flower stems 20 to 24 inches long, stout, rigid; inflorescence 2⅜ inches diameter, 1¼ inches deep, compact, very freely produced; flower $\frac{9}{10}$ inch diameter, single, pure white with greenish yellow eye; scent strong. [15]

COCCINEA. (Raised, introduced and sent by Messrs. Denholm Seed Co.) **H.C.** August 1, 1957. Plant 12 to 14 inches tall, 24 inches wide, vigorous, erect and compact habit; flower stems 12 to 15 inches long, medium thickness, rigid; inflorescence 2¼ to 2½ inches diameter, 1 inch deep, compact, very freely produced; flower $\frac{9}{10}$ inch diameter, single, Blood Red (H.C.C. 820) with small pale green eye; scent strong. [19]

MARILYN. (Raised, introduced and sent by Messrs. Denholm Seed Co.) **H.C.** July 25, 1957. Plant 14 to 16 inches tall, 18 inches wide, vigorous, erect and compact habit; flower stems 12 inches long, medium thickness, rigid; inflorescence 2½ inches diameter, 1 inch deep, compact, very freely produced; flower $\frac{9}{10}$ inch diameter, single, Geranium Lake (H.C.C. 20) with greenish white eye; scent slight. [16]

SHANGHAI. (Raised, introduced and sent by Messrs. William Macdonald Seed Co., Box 550, Santa Maria, California, U.S.A.) **H.C.** August 1, 1957. Plant 9 to 12 inches tall, 22 inches wide, vigorous, compact and slightly spreading habit; flower stems 12 inches long, medium thickness, rigid; inflorescence 2¼ to 2½ inches diameter, 1 inch deep, compact, very freely produced; flower ⅞ inch diameter, single, deep red near Cardinal Red (H.C.C. 822) with pale green eye; scent slight. [18]

SPARKLE. (Raised, introduced and sent by Messrs. Denholm Seed Co.) **H.C.** August 1, 1957. Plant 11 to 13 inches tall, 18 inches wide, very vigorous, bushy habit; flower stems 8 to 12 inches long, stout, rigid; inflorescence 2 to 2½ inches diameter, 1 inch deep, compact, freely produced; flower $\frac{7}{10}$ inch diameter, single, Orient Red (H.C.C. 819) with greenish white eye; scent slight. [5]

ZINNIAS

Fifty stocks of zinnias were received for trial at Wisley. The trial was sown under glass on April 17, 1957, the resulting seedlings being planted in the open on June 4, 1957, in rows 1 foot apart; each plant being spaced 1 foot apart in the row.

The trial was inspected by a sub-committee of the Floral Committee A on July 19, 25, August 9 and 19, 1957, and on its recommendation the Council of The Royal Horticultural Society has made the following awards to zinnias.

The number in brackets after the description of the variety was that under which it was grown in the trial.

CANARY BIRD. (Raised, introduced and sent by Messrs. Bodger Seeds Ltd., El Monte, California, U.S.A.) **A.M.** July 19, 1957. Plant 24 to 28 inches high, 12 to 15 inches wide, erect and compact; flower stems 10 inches long, erect, very stout, wiry; flowers 4½ inches diameter, compact semi-double; outer rays 2 inches long, $\frac{8}{10}$ inch wide, reflexed, tips slightly recurved; Indian Yellow (H.C.C. 6); disc ¾ inch diameter. [22]

GOLDEN STATE. (Raised, introduced and sent by Messrs. Bodger Seeds Ltd.) **A.M.** August 9, 1957. Plant 33 inches high, 15 inches wide, erect and compact; flower stems 12 to 14 inches long, erect, very stout, wiry; flowers 4½ to 4¾ inches diameter, compact, semi-double; outer rays 1¾ inches long, $\frac{7}{10}$ inch wide, reflexed, Saturn Red (H.C.C. 13); disc ⅜ inch diameter. [25]

PERSIAN CARPET. (Raised, introduced and sent by Messrs. Bodger Seeds Ltd.) **A.M.** August 9, 1957. Plant 16 inches high, 15 inches wide, erect and compact; flower stems 7 inches long, erect, stout, wiry; flowers 2$\frac{1}{10}$ inches diameter, compact, semi-double; outer rays ⅛ inch long, ⅜ inch wide, reflexed,

tips notched, bi-colours, cream and magenta, creamy yellow and maroon, yellow and maroon, golden yellow and maroon, golden yellow and scarlet, golden yellow and bronze, white and magenta, creamy yellow and magenta, lilac pink and magenta; disc $\frac{3}{8}$ inch diameter. [3]

CHERRY QUEEN. (Raised, introduced and sent by Messrs. Bodger Seeds Ltd.) **H.C.** July 9, 1957. Plant 20 to 22 inches high, 15 inches wide, erect and compact; flower stems 10 to 14 inches long, erect, stout, wiry; flowers $3\frac{3}{4}$ to $4\frac{1}{4}$ inches diameter, compact, semi-double; outer rays $1\frac{9}{10}$ inches long, $\frac{7}{10}$ inch wide, reflexed, Orient Red (H.C.C. 819); disc $\frac{3}{8}$ inch diameter. [41]

DREAM. (Raised, introduced and sent by Messrs. Bodger Seeds Ltd.) **H.C.** August 9, 1957. Plant 24 to 28 inches high, 15 inches wide, very erect and compact; flower stems 12 inches long, erect, stout, wiry; flowers $4\frac{1}{2}$ inches diameter, compact, double; outer rays $1\frac{9}{10}$ inches long, $\frac{7}{10}$ inch wide, reflexed, Rhodamine Purple (H.C.C. between 29/1 and 29/2); disc $\frac{3}{8}$ inch diameter. [27]

ORANGE KING. (Raised, introduced and sent by Messrs. Bodger Seeds Ltd.) **H.C.** August 9, 1957. Plant 24 to 28 inches high, 15 inches wide, erect and compact; flower stems 10 to 12 inches long, erect, very stout, wiry; flowers $4\frac{1}{2}$ to 5 inches diameter, compact, semi-double; outer rays $1\frac{9}{10}$ inches long, $\frac{9}{10}$ inch, wide reflexed, Dutch Vermilion (H.C.C. 717); disc $\frac{1}{2}$ inch diameter. [37]

PUMILA SCARLET. (Raised and sent by Messrs. Bodger Seeds Ltd.) **H.C.** August 9, 1957. Plant 28 inches high, 15 inches wide, erect and compact; flower stems 10 to 14 inches long, very erect, medium thickness, wiry; flowers 3 inches diameter, compact, semi-double; outer rays 1 inch long, $\frac{3}{4}$ inch wide, reflexed, tips slightly notched, a very rich velvety shade of Blood Red (H.C.C. 820); disc $\frac{3}{8}$ inch diameter. [14]

SCARLET GEM. (Raised and sent by Messrs. Bodger Seeds Ltd.) **H.C.** August 19, 1957. Plant 24 inches high, 15 inches wide, erect and compact; flower stems 12 to 18 inches long, erect, slender, wiry; flowers $1\frac{1}{2}$ inches diameter, compact, double; outer rays $\frac{3}{4}$ inch long, $\frac{3}{8}$ inch wide, slightly reflexed, Geranium Lake (H.C.C. 20); disc $\frac{1}{2}$ inch diameter. [9]

PLANTS TO WHICH AWARDS HAVE BEEN MADE IN 1957

CAMELLIA AND RHODODENDRONS

Camellia 'Elizabeth Johnstone' A.M. March 19, 1957. A cross between *C. reticulata* 'wild form' and an unknown camellia which has proved hardy in Cornwall and reached a height of 10 feet. The flowers are $4\frac{1}{2}$ inches across with nine waved petals and coloured a bright, rich shade of Camellia Rose (H.C.C. 622/2). It is of interest that the serrations of the leaves are very close together. Exhibited by G. H. Johnstone, Esq., O.B.E., V.M.H., Trewithen, Grampound Road, Cornwall.

Rhododendron argyrophyllum var. nankingense A.M. April 30, 1957. On this plant the leaves are elliptic, of a leathery texture and on the underside have a thin, felty indumentum, while the petiole is

grooved above and tough. The loose truss is made up of sixteen campanulate flowers, each of which is coloured Persian Rose (H.C.C. 628/3) shaded with some darker flushes chiefly on the lobes. Exhibited by Crown Estate Commissioners, Windsor Great Park, Berks.

Rhododendron (elliottii × 'May Day') 'Billy Budd' A.M. April 30, 1957. The leaves on this hybrid are elliptically shaped and waved at the margin, and on the underside show a light tomentum which is soon glabrous. Eleven flowers make up the lax, flat-topped truss and the campanulate corolla is coloured Turkey Red (H.C.C. 721/1). Exhibited from the R.H.S. Gardens, Wisley, Ripley, Surrey.

Rhododendron chaetomallum var. hemigymnum A.M. March 19, 1957. GEORGE FORREST collected the seed from which this plant was raised, in South-Eastern Tibet under his number F. 25605. Its leaves are narrowly obovate, 2½ inches long and 1¼ inches wide, and coated beneath with a thick, brown tomentum. The corolla is campanulate and coloured Orient Red (H.C.C. 819/3). The flowers naturally hang pendulous on long petioles and about seven of them make up each truss. Exhibited by Mrs. R. M. Stevenson, Tower Court, Ascot, Berks.

Rhododendron ('Azor' × 'Isabella') 'Cranbourne' A.M. June 4, 1957. It is interesting to note the exhibitors state that this hybrid has been grown in full sun and it might therefore be useful for planting under a variety of conditions. The large truss is formed from nine flowers and is open and flat-topped. The campanulate corolla is 3¼ inches long and 4½ inches wide and coloured a varying shade of Tyrian Rose (H.C.C. 24/2) and has a large, red blotch in the throat and reddish-brown spotting on the upper lobes. The leaves are 6½ inches long and 2¼ inches wide. Exhibited by Crown Estate Commissioners, Windsor Great Park, Berks.

Rhododendron floccigerum var. appropinquans A.M. March 19, 1957. In open moist situations at about 13,000 feet this plant is found naturally in South-Eastern Tibet. Its leaves are very narrowly elliptic, 3 inches long and ¾ inch wide, dark green above and glaucous below. The truss is made up of six pendulous flowers. The campanulate corolla is 1½ inches long and 2 inches wide; in colour it is pale cream with the edge of the lobes suffused with a very pale shade of Cherry (H.C.C. 722/3) and some pale, greenish spots on the upper lobes. Exhibited by Col. The Lord Digby, D.S.O., M.C., T.D., Minterne, Dorchester, Dorset.

Rhododendron forrestii var. tumescens A.M. April 2, 1957. The specimens of flowers exhibited were taken from plants raised from seed of DR. J. F. ROCK'S expedition of 1924–5 and grown under his number R. 59174. The elliptically-shaped leaves are scaly on the underside and the petiole ¼ inch long. Usually three flowers make up the truss and typically the calyx is petaloid varying in length up to ¾ inch. The corolla is 2 inches long × 2 inches wide, campanulate and coloured Cherry (H.C.C. 722–722/1); the lobes are reflexed. Exhibited by Mrs. R. M. Stevenson, Tower Court, Ascot, Berks.

Rhododendron ('Fusilier' × (Jalisco grex) 'Eclipse') 'Grilse', A.M. May 20, 1957. At Chelsea this plant was shown particularly well and its outstanding characteristics may well attract the attention of future hybridists. The full truss is well made up with ten flowers and is flat-topped. The corolla is 3 inches long and 4 inches across and coloured throughout an attractive bright, undefined reddish shade of Porcelain Rose (H.C.C. 620–620/1) apart from some dark crimson spots in the throat and on the upper lobes. Exhibited by Crown Estate Commissioners, Windsor Great Park, Berks.

Rhododendron hanceanum var. nanum A.M. April 16, 1957. Being dwarf in habit, this rhododendron is admirably suited for the rock garden. It is free-flowering, annually displaying terminal inflorescences, the flowers of which are a cream colour and the buds a contrasting shade of creamish-green. Exhibited by Crown Estate Commissioners, Windsor Great Park, Berks.

Rhododendron irroratum A.M. March 19, 1957. A species of variable characters found in the shady, pine and rhododendron forests of mid-west Yunnan. On the plant exhibited the truss was composed of eight pendulous flowers. The corolla was tubular-campanulate, 1¾ inches long by 2 inches across and white with a faint, bluish-pink tinge. The buds were tinged bright bluish-pink. Exhibited by Col. The Lord Digby, D.S.O., M.C., T.D., Minterne, Dorchester, Dorset.

Rhododendron irroratum 'Polka Dot' A.M. March 19, 1957. The distinctive, free-flowering, spotted form, which MR. DE ROTHSCHILD has used as a parent for some of his latest hybrids, was well shown. It is particularly interesting for its full, globular truss of twenty well-packed flowers. On these the corolla is tubular-campanulate in shape, 1¾ inches long by 2 inches wide and white in colour heavily marked throughout with spots of Paeony Purple (H.C.C. 729/1) and suffused with a shade of pink. Exhibited by Edmund de Rothschild, Esq., Exbury, Southampton, Hants.

Rhododendron (Duke of Cornwall grex) 'John Holms' A.M. April 9, 1957. From this cross has resulted a large shrub some 18 feet high and of rapid growth. It has tightly packed, globular truss made up of twenty-five flowers. Each of these flowers has a deep campanulate corolla coloured a shade of Cherry to Rose Red (H.C.C. 722–724) and some limited dark spotting on the upper lobes. Exhibited by Mr. and Mrs. A. C. and Mr. J. F. A. Gibson, Glenarn, Rhu, Dunbartonshire.

Rhododendron lochae A.M. July 30, 1957. By reason of it being the sole representative of the genus in Australia, this species is an interesting one. The detailed account and illustration of the plant appears in the *Botanical Magazine* (t. 9651). It will be noted however, that the specimen exhibited had somewhat brighter flowers than those depicted in the illustration and, in fact, were a light shade of Geranium Lake (H.C.C. 20). Exhibited by Crown Estate Commissioners, Windsor Great Park, Berks.

Rhododendron mollyanum 'Benmore' F.C.C. April 9, 1957.

At the first meeting of the Rhododendron and Camellia Committee to be held in Scotland a magnificent specimen of this lovely form was exhibited. It was raised from seed about fifteen years ago and the plant is now about 10 feet high and just starting to flower. The leaves are elliptic, 12 inches long and 5½ inches across, the underside silvery and the stout petiole 2 inches long. Each heavy truss was large, flat-topped and loosely made up of twenty flowers. The campanulate corolla was 2¼ inches long and 2¾ inches wide, and coloured a variable shade of Fuchsine Pink (H.C.C. 627/2) with some deep-pink staining and a small, deep-crimson blotch in the base of the throat. There were eighteen stamens and the stigma was disc-like. Exhibited by Younger Botanic Garden, Benmore, by Dunoon, Argyll.

Rhododendron (Emerald Isle grex) 'New Comet' A.M. April 30, 1957. An attractive hybrid (shown as Wisley 80) with a heavy globular, large truss of twelve flowers loosely packed. The corolla is shallow funnel-shaped, 4½ inches across and 2½ inches long, has reflexed lobes and coloured Mimosa Yellow (H.C.C. 602/1) flushed with a limited, irregular shade of pale pink recalling the presence of rhododendron 'Naomi' in its breeding. Exhibited from the R.H.S. Gardens, Wisley, Ripley, Surrey.

Rhododendron parryae A.M. April 30, 1957. Being native to Assam, this rhododendron is one to be grown under greenhouse conditions in Britain. The lax truss is made up of four flowers. These are shallow funnel-shaped, 3 inches long and 4½ inches across, and coloured white with a prominent yellow-orange blotch. Exhibited by Royal Botanic Gardens, Edinburgh.

Rhododendron (Racil grex) 'Hariet' A.M. April 9, 1957. With a parentage of such good garden plants as *R. ciliatum* and *R. racemosum*, this hybrid is becoming widely planted particularly in the rock garden. The leaves are broadly elliptic and scaly beneath. The clusters of bloom are made up of about twenty flowers, each of which are a rotate, campanulate shape, 1 inch long and 1¼ inches across and coloured a whitish-pink shade. Exhibited by Michael Noble, Esq., Ardkinglas, Argyll.

Rhododendron (Perseverance grex) 'Revlon' A.M. May 20, 1957. This plant makes another addition to the many lovely hybrids raised from the crossing of *R. cinnabarinum* with other rhododendrons. Typically the leaves are elliptic with the underside and petioles densely scaly. Pendant clusters of seven flowers make up the truss. Each flower is tubular-campanulate with large lobes and coloured Carmine (H.C.C. 21/1). Exhibited by Edmund de Rothschild, Esq., Exbury, nr. Southampton, Hants.

Rhododendron (Lactcombei grex) 'Robert Keir' A.M. April 2, 1957. This is a particularly fine hybrid, with a large, rounded and well-packed truss of fourteen flowers. On each of these the corolla is open campanulate, 2¾ inches long by 3 inches across. In colour the flowers are pale yellow deepening in the throat and lobes flushed, in varying

degrees, with pale pink, while the outside of the corolla is a dark shade of pink. The leaves are broadly elliptic, 7 inches long and 4 inches across, the base auricled and the stout petiole is 2 inches long. The plant is named after MR. ROBERT KEIR, for many years head gardener to the late MR. J. B. STEVENSON and subsequently to MRS. STEVENSON. Exhibited by Mrs. R. M. Stevenson, Tower Court, Ascot, Berks.

Rhododendron ('Blue Tit' × russatum) 'Song Bird' A.M. April 9, 1957. A rhododendron for planting on the rock garden. Clusters of violet flowers (H.C.C. 36/2) appear in bunches of about twenty blooms. Each corolla is rotate campanulate and ¾ inch long and 1 inch wide. Exhibited by Lt.-Col. J. N. Horlick, Isle of Gigha, Argyll.

Rhododendron 'Lochinch Spinbur' A.M. April 9, 1957. On this hybrid the narrowly elliptic leaves are 3 inches long and 1 inch wide and scaly on the underside. The truss is loosely composed of five flowers. In shape the corolla is tubular, 1½ inches long and 1 inch wide and coloured whitish-yellow with some pale pink staining. Exhibited by The Rt. Hon. The Earl of Stair, D.S.O., K.T., Lochinch Castle, Stranraer, Wigtownshire.

Rhododendron (Nausicaa grex) 'Wayford' A.M. April 2, 1957. A distinguishing feature of this plant is its magnificent foliage for the narrowly elliptic leaves are 13 inches long and 4½ inches across; beneath there is a sparse, grey tomentum. The truss is a large, heavy, flat-topped one containing about twenty-four flowers, each borne on a long, red-stained pedicel. The corolla is round, open campanulate, 2 inches long and 3 inches across; in colour white with dark crimson on the outside. The yellow stigma is disc-like. This plant was raised by MAGOR by crossing *R. calophytum* and *R.* 'Gill's Triumph'. Exhibited by Humphrey Baker, Esq., Wayford Manor, Wayford, Crewkerne, Somerset.

Rhododendron wiltonii A.M. April 30, 1957. About eleven flowers make up a loose truss. The campanulate corolla is white with a dark crimson blotch in the throat, while the outside is flushed irregularly with a shade of pink. Apart from its flowers, this shrub makes a good foliage plant as the leaves are puckered and glossy on the upper surface and below are coated with a reddish-brown felt. Exhibited by Edmund de Rothschild, Esq., Exbury, nr. Southampton, Hants.

TREES AND SHRUBS

Oxydendrum arboreum A.M. August 27, 1957. The Sorrel Tree, native of the Eastern U.S.A., belongs to the family Ericaceae and thrives under the same conditions as rhododendrons and azaleas. It makes an erect tree up to 50 feet in height, with oblong-elliptic, long-pointed and finely-toothed leaves up to 6 inches in length. It has already received the **A.M.** in recognition of its brilliant autumnal coloration; and now receives the award for its flowers. These are similar to those of the lily-of-the-valley, in racemes 4 inches long arranged in terminal

panicles. Exhibited by Lord Aberconway and the National Trust, Bodnant, N. Wales.

Plumbago capensis A.M. July 30, 1957. A semi-climbing cool greenhouse sub-shrub introduced from South Africa in 1818. It has pale green oblong or spathulate leaves 2 inches long, and short terminal spikes of long tubular flowers 1 inch across, with five Cobalt Blue (H.C.C. 44/3) petals. Exhibited by L. Maurice Mason, Esq., Talbot Manor, Fincham, King's Lynn, Norfolk.

Rosa kordesii 'Dortmund' A.M. July 30, 1957. A new and very hardy type of climbing or pillar rose reaching 10 to 12 feet in height. It flowers on the new wood and is in flower repeatedly during the season. The single velvety crimson flowers measuring 3½ inches across are near Cardinal Red in colour (H.C.C. 822) and show white at the base of the petals. They are borne in well-spaced trusses. The plant appears to be healthy and vigorous. Raised by Herr W. Kordes in Germany, introduced and shown by Messrs. Wheatcroft Bros. Ltd., Ruddington, Nottinghamshire.

Rosa kordesii 'Kolnam Rhein' A.M. July 30, 1957. Another of the new "repeat flowering" roses raised by Herr W. Kordes in Germany. The semi-double flowers, measuring 3 inches across, are rose Bengal (H.C.C. 25/1) in colour and the habit of the plant is similar to that of *Rosa kordesii* 'Dortmund'. Introduced and shown by Messrs. Wheatcroft Bros. Ltd., Ruddington, Nottinghamshire.

Rose 'Anna Wheatcroft' A.M. July 30, 1957. A very free-flowering medium-sized floribunda variety with single flowers measuring 3¼ inches across of a bright salmon shade near Mandarin Red (H.C.C. 17/1) showing cream at the base of the petals and having some perfume. It was raised in Germany by M. Tantau and is regarded as a new break in colour. Introduced and exhibited by Messrs. Wheatcroft Bros. Ltd., Ruddington, Nottingham.

Rose 'Highlight' A.M. August 13, 1957. This very attractive floribunda variety is the result of a cross between Rose 'Independence' and a seedling. The very freely produced double deep orange scarlet flowers borne in trusses are 2½ inches across when fully open. The plant appears to be of vigorous growth and the dark green foliage is bronzed at the edges. Raised, introduced and shown by Mr. Herbert Robinson. M.B.E., Victoria Nurseries, Burbage, Hinckley, Leicestershire,

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BOOK NOTES

"Flowering Stones and Mid-day Flowers." By G. Schwantes, translated by Vera Higgins. 8vo. xx + 420 pp. 8 coloured and 96 black-and-white plates; 50 text figs. (Ernest Benn Ltd., London 1957.) £7 7s.

Linnaeus's genus *Mesembryanthemum*, now elevated to family status with 125 segregate genera, features prominently in the present wave of popularity for succulents. Especially of interest are the dwarf, fleshy, highly xerophytic denizens of the wind-swept deserts of South Africa, nicknamed "Pebble Plants", "Mimicry Plants" and "Living Stones". Although annual and shrubby species have been known since the

earliest days of Cape botanizing, these attractive miniatures have come into their own only during the past thirty years. Dr. Schwantes was one of the three pioneer botanists to make a life-study of them: some of the most specialized of all land plants and complex in their every aspect save the deceptively simple outward form. His book is a monument of industry, and owes much to the excellent translation of Mrs. Higgins, who has successfully rendered the complicated text into simple, readable English. Some may regret that, with so much accumulated knowledge, the author has not given us a monograph with references, keys and descriptions of all species in a volume definitely in the monographic price category. The want is partly met by Jacobsen's *Mesembryanthemaceae* (Jena 1955; English translation in preparation) and *Verzeichnis* (Fedde Repert. 1938–9).

The main body of the book (pp. 5–334) comprises descriptions of the important genera with a wealth of detail on fruit structure, affinities, habitat, history, garden value and so forth. One special chapter is devoted to mimicry, one to capsule anatomy, and another to cultivation: all equally meritorious. But Chapter VII carries us with a bump from the world of scientific inquiry to that of teleology and quasi-mystical speculation. To Dr. Schwantes a *Lithops* is not the triumphant outcome of natural selection acting on chance mutations; it is a *Lithops* because its ancestors in some unspecified way defined their goal and worked out their own salvation. His quotations from Goethe and other philosophers re-echo Haworth's reactions in 1803 when (Misc. Nat. 101–2) he greeted the discovery of the hygroscopic capsule mechanism with a paean of joy, and burst into Psalm 104, italicized in Latin. These pages would have been better filled by a subject index or survey of identification or geographical distribution, which Dr. Schwantes fully understands, rather than genetics, which he does not.

Aside from this the book deserves whole-hearted praise for admirable presentation and illustrations, clear type and attractive format. It will be a mine of information for years to come. There are indices to genera and to the species of *Conophytum* and *Lithops*, which are singled out for extended treatment—a little piece of personal favouritism, no doubt, to which a distinguished author is entitled.

G. D. ROWLEY

"Dahlias for Everyone." By T. R. H. Lebar. 248 pp. Illus. (Blandford Press.) 18*s*. 6*d*.

In the past few years we have experienced the growth of a large number of "how-to-grow" books, and the dahlia enthusiast is now catered for by a comprehensive book written by Mr. Lebar, who has put his extensive and successful knowledge of this plant down in print.

The reader is taken step by step through all the aspects of dahlia-growing, right from the propagation stage to the final storage of the tubers in the winter. Illustrations show up various points in the text, whilst there is even a separate chapter on exhibiting blooms, which, as the author explains, is much more than just cutting a good bloom and putting it in a vase. Bearing in mind his past success at shows, these suggestions should be heeded by all would-be exhibitors.

There are included in the book some good pictures of various varieties, as well as illustrations showing the classification of dahlias; but not too much space is taken up in the choice of individual varieties, which is largely a matter for personal preference, as even more so is the chapter and picture on the use of dahlias for home decoration.

However, these points should not deter any dahlia-fancier from this book; as whether expert or beginner, he should be able to find many useful cultural tips on growing his plants.

GILES LODER

"Freesias." By W. F. McKenzie. 55 pp. Illus. (Ernest Benn.) 8*s*. 6*d*.

It is surely a tribute to the qualities and increasing popularity of the freesia that it should have a handbook all to itself. But it is a little disappointing that Mr. McKenzie has not made more of his opportunity in breaking what is virtually new ground. His survey which perhaps leaves something to be desired in its execution and presentation, is confined, except for a short chapter for amateurs, to the essentials of commercial practice. In the forty-odd pages of text, supplemented by a few indifferent illustrations, he describes the systems of production, growing from seed and from corms and the general management of the crop with notes on pests and diseases, and the information, so far as it goes, is sound and up to date and will be found useful to those embarking on commercial growing. There is some repetition here and there, and certain details like the lists of varieties and market prices could well have been omitted. On the other hand,

the history and development of the flower are all too briefly dealt with, and not without error. The botanist who first recorded the flower was Jacquin, not Jaquin, and his book, *Icones Plantarum Rariorum*, not *Scones Plantarum Rariorum*. Scant reference is made to the work of our two English growers, the late Hew Dalrymple and Herbert Chapman, who in their respective ways, probably did more than most to improve and popularize the freesia. But these are perhaps minor blemishes in a straightforward little textbook which the market grower beginning with freesias will find quite helpful, if not quite so detailed as Mr. Sennel's guide, based on Scandinavian practice, which appeared some six years ago.

G. C. TAYLOR

"Plant Propagation in Pictures." By Montague Free. (Museum Press Ltd., London, 1957.) 251 pp. Illus. 32*s*. 6*d*.

Books on plant propagation have been appearing with regularity during the past few years and this one, like some of the others, originates in the U.S.A., but is completely different in its method of presenting the story of various ways in which plants can be increased.

Mr. Free, who received his initial training in England, is a prolific writer on sound garden practices in the U.S.A. and in this new work he succeeds in putting over, in about 350 pictures of excellent clarity, all the main techniques employed to raise a very wide range of plants.

The author also succeeds in making the subject appeal to the inexperienced and does not stress the need of extensive or expensive equipment. He is none the less up to date and the modern technique of using plastic coverings for cuttings and the application of constant mist is illustrated. The book will appeal to those who grow "house plants", and the current vogue of "do it yourself" is amply catered for. I would specially recommend this book to teachers of school gardening for much of what is illustrated can be successfully undertaken in the schoolroom.

I know of no other book which illustrates so many examples of raising plants. I found I could not drop it when once I had delved into the first few pages.

F. P. KNIGHT

"The Gladiolus To-Day." By H. G. Witham Fogg. 190 pp. Illus. (Gifford.) 16*s*.

Judging by the enthusiasm of Fellows exhibiting in the Gladiolus Competition at our Halls and the high standard of trade exhibits there is no doubt that a new and authoritative book on gladiolus would be received well. To a certain extent Mr. Witham Fogg's treatise will prove of value to some readers; among other things, there are short chapters on such interesting subjects as "Scented Gladiolus" and "Breeding New Varieties". In addition the author holds nothing back from the newcomer for he boldly lists the pests and diseases which trouble growers.

But the book has its shortcomings. Scientifically, part of the casual remarks on hoeing have been proved wrong and, surely, it is brash and misleading to dismiss the use of artificial fertilizers by saying little more than, "They (inorganic and chemical fertilizers) prevent the delightful undertones of many of the modern varieties from being seen in all their scintillating beauty". Notwithstanding, any author may fairly expect some help from his publishers, but this is rarely apparent. Factual, typographical and spelling errors abound. As examples, it may be pointed out that *G.* × *childsii* and *G.* × *colvillei* are not species, and the generic name of all plants when given in the Latin form is written with a capital letter, not as "*prunus pissardii*". A list of the spelling mistakes—particularly among the varietal names—would not serve any useful purpose as these can be found at fairly regular intervals.

ROBERT ADAMS

"Stapeliads in Cultivation." By Edgar Lamb. Demy 8vo. 156 pp. Illus. (Blandford Press.) 30*s*.

This book follows the pattern of Mr. Lamb's *Illustrated Reference on Cacti and other Succulents*, but is more specialized in its scope, the original thirty Stapeliads being now increased to over one hundred. The book is not intended to be botanical, no scientific descriptions are given, but each of the illustrations is accompanied by a brief note giving useful particulars, including the treatment required, the object being to give the amateur grower a ready means of identifying his plants. The black-and-white illustrations are

quite good and, where enlarged, the natural size is indicated; some of the twenty-seven colour plates are very fine; altogether they cover a wide range including not only *Stapelia* but the related genera of *Caralluma*, *Echidnopsis*, *Hoodia*, *Huernia* and *Trichocaulon*, as well as some of the less usual ones. The text is chiefly concerned with cultivation, which is clearly and fully described. This book should be very helpful to anyone interested in this fascinating group of succulent plants, reputedly difficult to grow.

VERA HIGGINS

"In the Flower Garden with Percy Thrower." 96 pp. Illus. (Collingridge.) 7*s*. 6*d*.

This little book is arranged as a sequence of work in the garden, month by month, and the directions are framed colloquially, having been taken from the talks prepared for the author's television appearance, but it contains much sound advice. Mr. Thrower is also superintendent of the Shrewsbury Parks.

"The Bulletin of the Hardy Plant Society." Vol. I, No. 2. 1957. (2–10 Tavistock St., Covent Garden, London, W.C.2.)

The aims of the Society are to further the culture and improvement of hardy herbaceous plants (excluding rock garden plants) and to stimulate interest in such plants both old and new. Such plants still occupy a large part of the majority of our gardens and so many gardeners should give a warm welcome both to the newly formed Hardy Plant Society and to its bulletin. In this issue there are interesting articles by Will Ingwersen, Alan Bloom (the Chairman of the Society), S. M. Gault, Frederick Fletcher and Margery Fish, as well as notes by other authors. Of particular interest is the one on hardy terrestrial orchids.

PATRICK M. SYNGE

"John Innes Horticultural Institution." Forty-seventh Annual Report, 1956. (Bayfordbury, Hertford, Herts.) 3*s*.

As usual the report discusses briefly the work accomplished in the numerous and very varied lines of research which the Institution has in hand. Probably the most interesting to gardeners are those concerned with the breeding of new varieties of fruit, of tomatoes and also the trials of the different rose stocks, but Mr. W. J. Lawrence's work on controlled environment rooms and glasshouse climate should also yield some helpful basic knowledge for horticulture. The publication record of the staff for the year is impressive.

"Drawings of British Plants. Part X.—Saxifragaceae, Crassulaceae." By Stella Ross-Craig. (Bell and Sons Ltd., London.) 8*s*. 6*d*.

Once again botanists and all interested in our native plants should be pleased with the very high standard of the drawings in the tenth part of this most useful work. The next parts will be awaited with interest.

ERRATUM

R.H.S. JOURNAL, Vol. 82, November, 1957, "Mist Technique Propagation", p. 466, para 2.—The thickness of the polythene film should read 0·002 inch and not 0·0002 inch and in para. 4 it should read 0·005 inch and not 0·0005 inch; p. 470, para. 3, also should read 0·002 inch.

ORDERS FOR BOOKS

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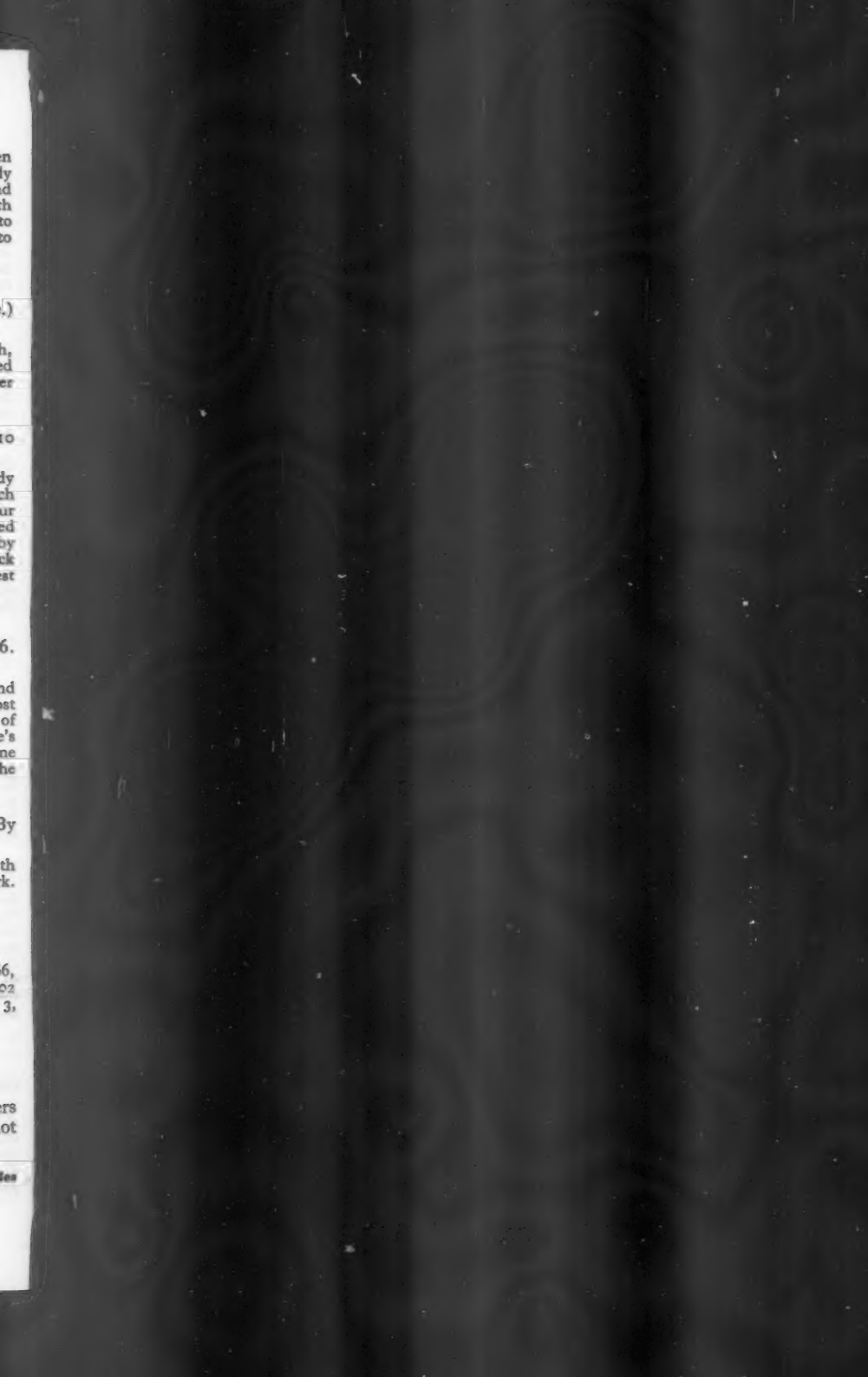

1958 YEAR BOOKS

Rhododendron and Camellia

The Rhododendron Society did much valuable work in the interest of the genus between 1915 and 1952 and Mr. G. H. Johnstone gives us an interesting history of the Society. The article on the gardens on the Isle of Gigha gives an idea of the problems facing a garden maker in the Western Highlands and how they may be overcome. The interesting collections of rhododendrons at Pylewell Park and at Westbourn, Wentworth, are described. Mr. Madison of Seattle, U.S.A., has written on the freak season of 1955 and its effect on rhododendrons in that area. Donald Waterer contributes a useful article on the Ghent azaleas. Mr. Heutte describes camellia growing in Virginia and Sir Giles Loder, who visited California in the spring, has written an account of the camellias he saw there in a number of gardens. There is a growing interest in camellias in New Zealand and in his article Col. Durrant refers to species and varieties which do best there. Show reports and Awards are again included in this issue.

Lily

The 1958 issue is dedicated to Frank Kingdon-Ward, the well-known plant collector and explorer who has introduced a number of new lilies. Sir Frederick Stern writes about recent hybrids he has raised or grown at Highdown. There are several articles describing the cultivation of lilies in various parts of this country; Mr. D. Cuthbert writes on the lilies in his Northumberland garden, Mr. G. C. Taylor on lilies in Col. Leslie's garden in Norfolk and Lord Elphinstone discusses the cultivation of American hybrids in Scotland. Readers will be interested in Mr. de Graaff's article on commercial lily growing in Oregon, U.S.A. Other overseas contributions come from Mr. Byam, who recounts his experience of lily growing in East Canada, and Mr. Barnet writes from New Zealand. Mr. E. B. Anderson prepared a very informative and useful paper on the genus *Erythronium* for a Lily Group discussion and this is published in this issue.

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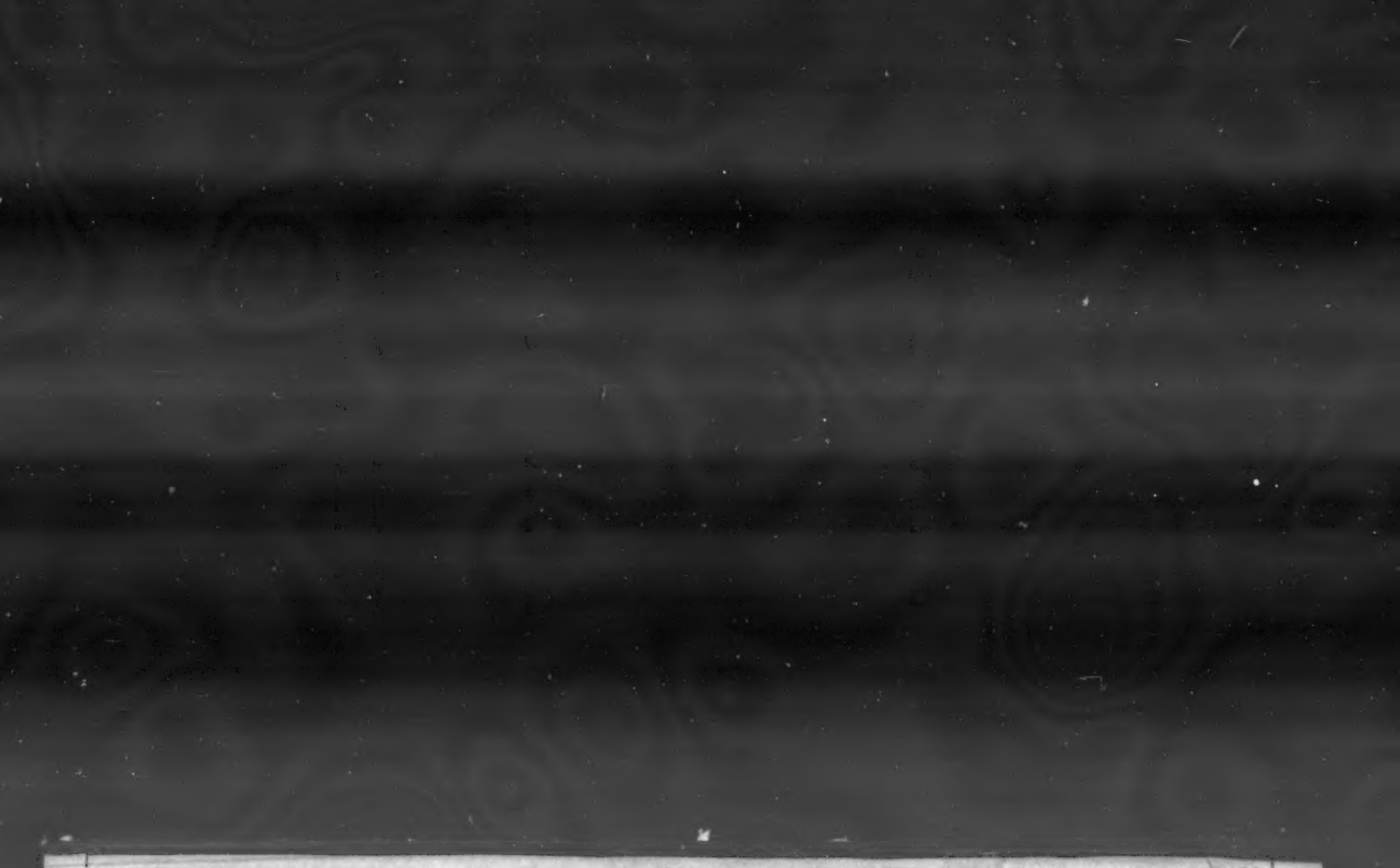
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